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EARLY VIEW

Key to the bee genera of the tallgrass prairie region and greater Midwest U.S.

Michael Arduser[1]

Abstract. This contribution provides an identification key to the bee genera of the tallgrass prairie ecosystem and greater Midwest of central North America. The geographic scope follows The Nature Conservancy's ecoregional framework, including the Northern and Central Tallgrass Prairie, the Osage Plains, Oklahoma portion of the Southern Tallgrass and Cross Timbers, and all or part of ecoregions eastwards to the western margin of the Appalachians. However, because many bee genera and species in this geographic region extend beyond its defined boundaries, the key may also prove useful more broadly. Taxa potentially present in the region but not yet documented are also included. The key facilitates the identification of both males and females of 69 genera, with 25 species identified individually. It also incorporates supplementary biological information, including floral specialization, habitat preferences, seasonal activity, geographic distribution, and relative abundance, to assist with identification. This key, along with the identification keys to species in individual genera to be published in subsequent contributions, aims to support researchers, land managers, and conservation practitioners working with prairie bee diversity.

INTRODUCTION

The purpose of this initial contribution is to provide an identification key to the bee genera found in the tallgrass prairie region (TGP) and adjacent areas (the Greater Midwest), an ecosystem native to central North America; subsequent contributions will treat species in individual genera. This key has grown out of the author's interest in the bee fauna of the tallgrass prairie region and greater Midwest U.S. (see below for geographic specifics) over the past several decades. It has been continuously updated and improved based on suggestions and corrections from the many participants in the bee identification and ecology workshops the author has taught since 2010, as well as from many bee specialists working in the Midwest.

The tallgrass prairie (TGP) and greater Midwest region referenced here follows the Nature Conservancy's ecoregion map (Groves *et al*., 2002) and includes the Northern and Central Tallgrass Prairies, the Prairie-Forest Border, the North-Central Tillplain, the Interior Low Plateau, the Osage Plains, the Ozarks, and portions of several adjacent ecoregions. Together, these ecoregions include all or parts of the following states east of the 98th Meridian: Arkansas, Illinois, Indiana, Kansas, Kentucky, Michigan, Minnesota,

[1] Research Associate, Conservation Research Institute (arduser.michael@gmail.com)

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Missouri, North Dakota, Nebraska, Ohio, Oklahoma and Wisconsin. Several eastern states, such as Mississippi and Ohio, have small prairie remnants within their borders and the key will work for the bees inhabiting these sites (Fig. 1). For completeness, this key includes or mentions genera with species that are known to occur just outside the defined geographic boundaries ("extralimital"), as these taxa may also occur in the region but remain undocumented (*e.g.*, *Ancyloscelis, Centris, Macrotera*). All introduced (exotic) genera known to be established in North America as of 2025 are included in the key. It is important to note that because most of the genera in the TGP region and in the greater Midwest as defined above occur beyond those geographies to a greater or lesser degree, the key may be useful across much of eastern North America. The families, subfamilies, and genera treated in the key, together with the number of species known or potentially occurring in the region, are summarized in Appendix 1.

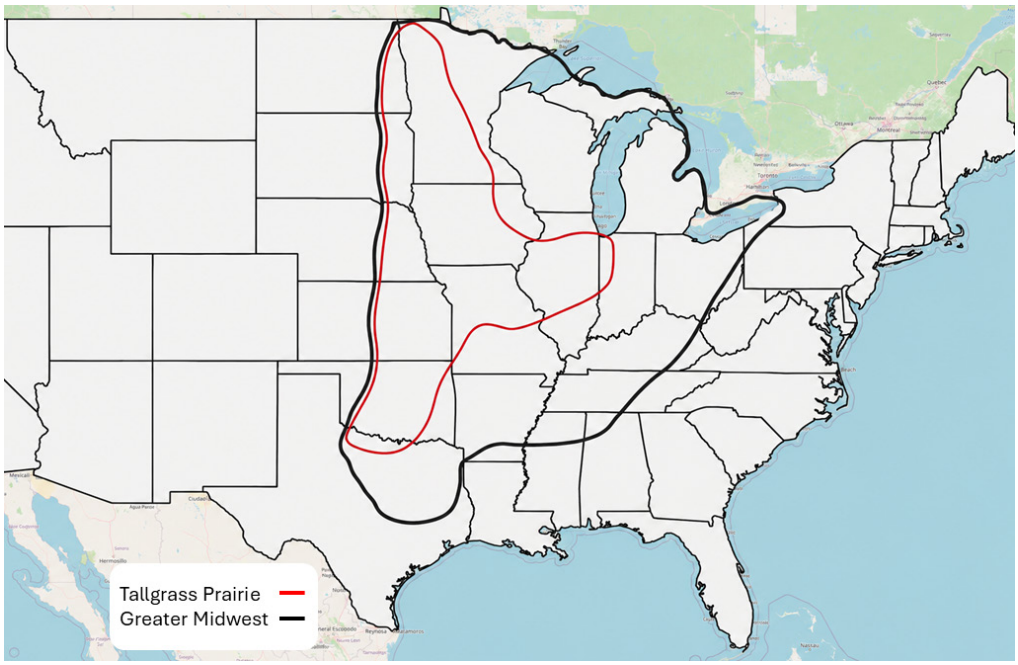


Figure 1. Geographic extent of the Greater Midwest (black outline) and Tallgrass Prairie (red outline) regions of central North America, based on The Nature Conservancy's ecoregional framework.

Classification, Nomenclature, and Terminology Used in the Key

For the most part, the generic and subgeneric names and interpretations herein follow Danforth *et al*. (2026). Species-level taxonomy usually follows the most current revisions, or the current list in Discover Life (Ascher & Pickering, 2026). There are some exceptions, and these exceptions are always mentioned at the beginning of the keys. Genera that include well-defined subgenera (*e.g.*, *Protandrena*) usually have the subgenera key out separately from the genus. Some subgenera, however, are not easily defined morphologically, thus some species in the *Lasioglossum* subgenera *Evylaeus, Hemihalictus,* and *Sphecodogastra,* subgenera re-defined recently by Gibbs *et al.* (2013), are incorporated here into a single entity, the "non-metallic *Lasioglossum*, in part" because of the challenges involved in separating those re-defined subgenera. Genera or

subgenera that have only one species present in the region [*e.g.*, *Ptilothrix bombiformis*, *Epimelissodes* (*Anthedonia*) *comptus*] have the species name included in the key couplet that identifies the genus or subgenus. The Eucerini, in part, are a special case; females in *Xenoglossa* (*Xenoglossodes*), for example, key out independently from the subgenus, because of the difficulty identifying the genus morphologically. Several structures and terms are abbreviated in the key. In other cases, these structures have received other names, and they are listed in Table 1.

Table 1. Abbreviations and alternative morphological terms used in the identification keys.

Abbreviation / meaning	Morphological term / alternative term
F = flagellar segment, *i.e.*, F1, F2, etc.	Scutum = mesonotum
T = tergum, *i.e.*, T1, T2, etc.	Pleura = mesopleura
S = sternum, *i.e.*, S1, S2, etc.	Propodeal triangle = dorsal enclosure of propodeum = metapostnotum *in part* = dorsal triangle
DV = dorsoventral	Propodeum = metapostnotum
DL = dorsolateral	
SM = Submarginal	

Key Shortcuts

Experienced users can quickly identify female or male specimens to family or tribe. To avoid going through the key from the beginning, they can use the shortcuts indicated below to quickly identify them.

Females:
all cleptoparasitic taxa: couplet 3
all pollen-collecting Megachilidae: couplet 21
all pollen-collecting Anthidiini: couplet 21
all pollen-collecting Halictinae: couplet 35
all Andrenidae: couplet 46
all Panurginae: couplet 48
all Eucerini: couplet 78
Traditional pollen-collecting "Anthophoridae" (of Mitchell, 1962): couplet 67

Males:
all Megachilinae: couplet 104
all bright green Halictidae: couplet 126
all Eucerini and Emphorini: couplet 162
all Panurginae: couplet 94

KEY TO THE BEE GENERA OF THE TALLGRASS PRAIRIE REGION AND GREATER MIDWEST U.S.

1. Females. Sting present (but often retracted); six terga; 12 total antennal segments....2
—. Males. Sting absent, genital capsule present but usually retracted; seven terga; 13 total antennal segments, except 12 in *Holcopasites*....91
2(1). Scopa absent (includes *Hylaeus* and all parasitic taxa); the scopa is an arrangement of hairs specifically for holding, transporting, and sometimes collecting pollen.... 3
—. Scopa or corbicula present, but in the absence of a pollen load may appear sparse in some groups, e.g., *Perdita*; scopa typically present on hind tibia, but in some groups may also be on hind femur, coxa, trochanter, and basitarsi as well as on sides of propodeum and abdominal sterna (restricted to abdominal sterna in Megachilidae). *If uncertain, compare hairs of hind leg to hairs of mid leg, and shape/size of hind leg to midleg; in most pollen-collecting species the hind leg hairs and hind leg morphology are notably different from the midleg, but are similar in cleptoparasitic species*....18
3(2). Large to very large (14–20 mm or greater) and bumble bee-like, without appressed white hair patches; S6 lateral margin with a ridge or swelling (oblong to narrow); T6 without any long hairs, contrasting with the long hairs on T1–T5 ....parasitic *Bombus*
—. Usually smaller and not bumble bee-like; S6 usually without lateral ridges or swellings, but if so, then bee without long hairs, and adorned with a pattern of white appressed hair patches; T6 variable 4
4(3). Glossa very short, apically bilobed or blunt; inner margin of each eye paralleled in part by a very narrow linear depression (the facial fovea); mostly black bees usually with yellow/ivory maculations on face, legs, and usually pronotum, but abdomen without any maculations.... *Hylaeus*
—. Glossa short or long, apically pointed or simple, but never bilobed or blunt; facial fovea absent; body color and hairs various....5
5(4). Basal vein arched; glossa short and acute, length about 2-3 times its width; abdomen without integumental color bands or maculae, with sparse erect hair and little to no appressed pubescence 6
—. Basal vein straight; glossa long and narrow (length at least 8 times its width); abdomen either with appressed pale pubescence (usually in a distinct pattern) or with integumental color bands (yellow, red, white, black)....7
6(5). Head and thorax dull green or bluish; abdomen usually dark brown to blackish, occasionally reddish-brown, but never red or orange; mandible usually lacking preapical tooth; 8 mm or less ....*Lasioglossum* (*Dialictus*, in part)
—. Head and thorax black, never dull metallic green or blue; abdomen almost always red to orange, at least in part; mandible variable, with or without preapical tooth; size variable, 3–14 mm .... *Sphecodes*
7(5). Mandible apex 3-toothed; pygidial plate absent; labrum as long as broad or a little longer; 2 submarginal cells (parasitic megachilids) 8
—. Mandible apex usually simple, sometimes with a small preapical tooth; pygidial plate usually present; labrum variable but often short (*i.e.*, wider than long); usually 3 submarginal cells, occasionally 2 and very rarely one....9
8(7). Eyes hairy (under magnification hairs are short, erect, dense); apex of abdomen (T6 and S6) conspicuously pointed, general appearance of abdomen like an isosceles triangle; abdomen usually dark with partial bands or patches of white, appressed pubescence .... *Coelioxys*

—. Eyes completely bare, without any hairs; apex of abdomen rounded, not pointed, and abdomen more fusiform, not shaped like an isosceles triangle; abdomen without hair bands or any pattern of white appressed pubescence, but often with yellow, ivory or rarely reddish maculae (in some cases these are inconspicuous "dots"), occasionally all dark ..... *Stelis*

9(7). Small, 6 mm or less, and labrum longer than broad, as much as twice as long as broad or a bit longer; two submarginal cells; abdomen reddish, reddish-orange, or blackish, and flecked with a pattern of white to pale yellowish appressed pubescence, rarely dark flecked with gold hairs; pygidial plate broad, rounded apically; T5 medially usually with a narrow, raised impunctate zone..... ..... *Holcopasites*

—. Any of the following: bee larger; labrum shorter; no pale appressed pubescence on abdomen; abdomen with colored integumental bands; or three (rarely one) submarginal cells 10

10(9). Very small bee (4 mm or less), largely covered with pale yellowish appressed pubescence and with only one submarginal cell; marginal cell minute, shorter than the single submarginal cell; very rare, in sandy habitats ..... *Neolarra*

—. Usually larger, and almost always with three submarginal cells (rarely two, and never one); marginal cell much longer than any single submarginal cell; appressed pubescence often absent on abdomen, <u>if</u> present then it forms a distinct pattern, not a uniform covering 11

11(10). Abdomen without appressed pale pubescence, either largely bare and maculated with red, yellow, black or white (bee rarely all black), <u>or</u> abdomen extensively hairy with erect to suberect blackish hairs..... 12

—. Abdomen with bands, partial bands, or other patterns of appressed pale pubescence, integumental maculations absent, dark erect hairs absent 14

12(11). Bee integument all blackish and quite hairy, hairs obscuring integument in part; S5 without unique hair fringe, hair pattern on S5 similar to that on other sterna; labrum as long as broad or slightly longer; mandible simple apically, but with a single tooth/angle located on inner surface midway between base and apex of mandible; scutellum with pair of small spinose tubercles, one on either side of midline, usually hidden by dense pubescence; rare bee; 10–12 mm ..... *Melecta pacifica* Cresson

—. Bee integument (especially abdomen) colored with some combination of red, yellow, white, black, rarely all red or all black; bee integument easily seen, not obscured by hair 13

13(12). S6 apex truncate, subtruncate or very weakly emarginate; maxillary palps more than half as long as blade of galea; usually maculated on head, thorax or abdomen with red or yellow; size variable, 3–15 mm; common bees through TGP ..... *Nomada*

—. S6 apex elongate, bifurcate; maxillary palps less than half as long as blade of galea; small bees, thorax and head all black, abdomen red; 6 mm or less; rare bees, central and southern TGP ..... *Brachynomada*

14(11). T5 with a pseudopygidial area (this is a small to large "patch" of short, dense, light-colored, highly reflective setae on surface of tergum); axillae acute and often produced beyond posterior margin of metanotum as an angle or tooth; mandible simple; common bees 15

—. T5 surface uniform, without a pseudopygidial area; mandible variable; axillae not angularly or acutely produced; uncommon to very rare bees 16

15(14). S6 composed of a pair of narrowly separated long slender rods that are multispinose apically, claw-like; T5 pseudopygidial area extensive; vertex posterior margin rounded, very rarely carinate; usually 10 mm or more..... .... *Triepeolus*

—. S6 composed of a pair of shorter, more widely separated processes that are finely denticulate at their apex; T5 pseudopygidial area comparatively reduced; vertex posterior margin usually (sometimes weakly) carinate; usually less than 10 mm ..... *Epeolus*

16(14). Bee relatively small (7–9 mm), mandible with a small preapical tooth; scutellum simple; without black-and-white spotted appearance; very rare parasite of *Macropis* ..... *Epeoloides pilosula* (Cresson)

—. Bee larger (10–14 mm), mandible simple apically; bee decorated with black-and-white spots, partial bands of tomentum, or appressed hairs, especially on the abdomen 17

17(16). Scutellum with two broad teeth separated by a shallow groove; inner margin of mandible medially with two small teeth; mid-tibial spur simple; widespread species ..... *Brachymelecta*

—. Scutellum without teeth or projections; inner margin of mandible without distinct teeth or angles; mid-tibial spur bifid or forked; rare, central and southern TGP ..... *Ericrocis*

18(2). Hind tibia with corbicula (*i.e.*, hind tibia outer surface bare, more-or-less flattened, and fringed with curved hairs along margins); includes only *Bombus* and *Apis* [Note: One species of *Euglossa* (*E. dilemma* Bembe & Eltz) has been found recently in peninsular Florida, and may eventually be found in the coastal prairie areas of Louisiana and Texas. Any female *Euglossa* would come to this couplet (*i.e.*, corbicula present); all are strikingly green/blue/purple/ with a white labrum and a long tongue.] 19

—. Hind tibia without a corbicula as defined above, hind tibiae outer surface uniformly hairy, either with long pollen-carrying hairs or very short appressed hairs, but never bare with margins fringed 20

19(18). Largely covered with black and yellow pubescence, occasionally abdomen or thorax with some red, orange or brownish pubescence; eyes bare; marginal cell 3-4 times as long as broad; usually large (12 mm or more), but occasionally smaller ..... *Bombus, in part*

—. Pubescence pale; eyes hairy; marginal cell long and narrow, about 8 times as long as broad; 12 mm or less ..... *Apis mellifera* Linnaeus

20(18). Hind leg without scopal hairs, scopa present only on sterna; 3 or more mandibular teeth but teeth sometimes worn and obscure; hind basitibial plate absent; pygidial plate usually absent (present only in *Lithurgus/Lithurgopsis)*; pollen-collecting Megachilidae 21

—. Scopa present on some part of hind leg (tibia, femur, etc.), though scopal hairs may occur on sterna as well; mandible usually with a single preapical tooth or simple, rarely with three or more teeth (only in *Anthophora terminalis* and *Centris*); hind basitibial plate and pygidial plate often present 34

21(20). Integument of abdomen (and usually thorax and head) maculated with whitish, yellowish or occasionally reddish markings (*Anthidiini*) 22

—. Integument of abdomen, thorax and head without maculae, instead all dark, occasionally metallic green or blue (apical pubescent fasciae, hair bands or hair patches often present on abdomen and thorax, and these may be mistaken for maculae at a glance) 27

22(21). Mandible with 5 or more teeth of various sizes, some may be quite small; anterior face of mesopleura confluent with lateral face, not separated by a carina or sharp edge; pronotal lobe variable, either rounded, with a weak carina, or lamellate 23

—. Mandible with no more than four teeth 24

23(22). Medium to large-sized bees, 10 mm or more; mandible with 6 or more teeth of various sizes, some quite small; front femur baso-ventrally rounded; pronotal lobe variable ..... *Anthidium*

—. Small bees, about 6 mm; 5 mandibular teeth; pronotal lobe strongly carinate, almost lamellate; front femur baso-ventrally sharply angulate….. *Pseudoanthidium nanum* [Note: *Pseudoanthidium nanum* is an introduced species that has recently been found in several areas in the upper Midwest, all urban areas thus far.]

24(22). Omaulus carinate at least in upper part; *if* carina weak [only in *Dianthidium texanum* (Cresson), a rare species] *then* interantennal area with a pair of disc-like swellings 25

—. Omaulus rounded; uncommon species 26

25(24). Metanotum with lateral (or medio-lateral) hair tufts; scutellum with posterior margin out-curved (*i.e*., convex); pronotal lobe with broad lamella; scutum anterior margin sharply truncate above pronotum .....*Dianthidium*

—. Metanotum without any hair tufts; scutellum with posterior margin straight; pronotal lobe with small carina, not lamellate; scutum anterior margin evenly confluent with pronotum .....*Anthidiellum*

26(24). Pronotal lobe narrowly lamellate; ocelli very small, their diameter smaller than antennal sockets, and separated from eye margin by at least 5 times their diameter; widespread .....*Paranthidium jugatorium* (Say)

—. Pronotal lobe rounded, not lamellate or carinate; ocelli larger, and separated from eye margin by only 2–3 times their diameter; rare .....*Trachusa*

27(21). Parapsidal lines not linear, but very small and round (elliptical at most), with the appearance of small "dots"; entire body dull blue or dull green, rarely brilliant green/purplish, rarely all black .....*Osmia*

—. Parapsidal lines variable, never round or "dot-like", usually linear; integument dark, not bluish or greenish, never with metallic sheen 28

28(27). Large conspicuous facial prominence located just below the antennae; T6 apically with a very small pygidial plate, which looks like a small spine, easily overlooked; outer surface of hind tibia roughened with coarse, short spicules; in appearance bees superficially resembling *Megachile* species.....29

—. Face lacking any conspicuous prominence below the antennae, and lacking any indication of a pygidial plate or spine on T6 apically, T6 apical margin more-or-less rounded; outer surface of hind tibia not coarsely spiculate 30

29(28). F1 little longer than broad, if at all; *Opuntia* specialists……...*Lithurgopsis*

—. F1 about twice as long as broad; introduced species, *Centaurea* oligolege ……*Lithurgus chrysurus* Fonscolombe [Note: This is an introduced species that, until recently, had not been known in the US outside of the northeast; it resembles our native *Lithurgopsis* species, but is smaller, and an oligolege of *Centaurea*, not *Opuntia.* It was found in 2023 in the Detroit area. It may show up elsewhere in the Midwest or TGP region because of the abundance of the introduced *Centaurea stoebe* (=*maculosa*) in those regions. It flies in mid-late summer, while our native *Lithurgopsis* species fly in the late spring/early summer].

30(28). T1 anterior surface separated from T1 dorsal surface by a weak line or rim, transitioning abruptly to the T1 dorsal surface; T1 anterior surface concave (dish-shaped) to flattened……..….31

—. T1 anterior surface not separated from T1 dorsal surface by a weak line or rim, transitioning gradually to the dorsal surface 33

31(30). Omaulus carinate; mandible with three distinct teeth and no "cutting margins" between the teeth .....*Ashmeadiella*

—. Omaulus rounded; mandible variable, but often with four or five teeth, and/or cutting margins present between some of the teeth; head variable, *if* large and vertex greatly expanded *then* bee larger than 12 mm 32

32(31). Propodeum with dorsal component reticulate or pitted, very narrow and on same plane as dorsum of thorax; small (8 mm or less), strongly punctate, bullet-shaped bees .....*Heriades*

—. Propodeum without a dorsal component, and more-or-less perpendicular to, or sharply angled towards, dorsal surface of thorax, and never pitted/ reticulate; size variable, usually larger than 8 mm, rarely smaller .....*Megachile*

33(30). Narrow, elongate bees with long narrow mandibles (maximum length of mandible about 3 times as long as basal width or longer); apical margin of clypeus punctate or denticulate, not narrowly smooth and shiny.....*Chelostoma*

—. More robust, chunky bees, the mandibles more quadrate, maximum length of mandible usually about twice as long as basal width, never 3 times as long as basal width; clypeus usually with very narrow, flattened, shiny apical margin, very rarely denticulate .....*Hoplitis*

34(20). T5 divided medially by a narrow, ostensibly hairless zone, other terga entirely simple, without such a division; glossa short, acute; pygidial plate present but small, *frequently concealed by T5*; coloration black to dull or bright metallic green or bluish, integument without maculations; pollen-collecting Halictinae.....35

—. T5 similar in appearance to T4, without a medial division; glossa variable, often long and narrow, but occasionally short and bilobed; pygidial plate variable, often absent, but sometimes large and distinct; integument usually dark but occasionally blue or greenish (*e.g.*, *Ceratina, Perdita*), sometimes with maculations 44

35(34). Head and thorax bright metallic green. Any female *Euglossa* would come to this couplet (*i.e.*, corbicula present); all are strikingly green/blue/purple/ with a corbiculate hind tibia, a white labrum and a long tongue 36

—. Head and thorax not bright metallic green, but instead either blackish, dull blue or dull green 39

36(35). Propodeum with posterior surface encircled by a strong raised rim (carina); basal half or so of mandible usually yellow .....*Agapostemon*

—. Posterior surface of propodeum not encircled by a carina, though carinae may be present laterally in part; mandible all dark, not partially yellow..... 37

37(36). Tegula asymmetric, its inner posterior margin hooked or angled...*Augochloropsis*

—. Tegula oval in outline, symmetric 38

38(37). Apex of mandible with a small preapical tooth; sternum 1 flat, without a central keel .....*Augochlorella*

—. Apex of mandible with two distinct and similarly-sized teeth (bidentate); sternum 1 with a strong central keel..... *Augochlora pura* (Say)

39(35). Terga with pale to white apical pubescent fasciae, basal fascia often present as well; distal veins of forewing (2nd and 3rd transverse cubitals and 2nd recurrent) strong, similar in diameter to other veins .....*Halictus*

—. Terga without apical fasciae, but basal or basolateral fasciae often present; forewing with 2nd and/or 3rd transverse cubital veins and 2nd recurrent vein weakened, these more faint than the 1st transverse cubital (*Lasioglossum s.l)*....40

40(39). Head and thorax dull greenish or bluish, sometimes with "brassy" overtones; abdomen color variable, usually dark but occasionally greenish, bluish, or orange-red; bees usually no more than 8 mm in length... *Lasioglossum* (*Dialictus*)

—. Head and thorax dark, not blue or green; abdomen usually dark but rarely reddish-orange; bee often greater than 8 mm in length.....41

41(40). Forewing with only 3rd transverse cubital vein weakened, 1st and 2nd stronger and thicker than 3rd; T2–T3 usually with strong *basal* fascia..... .....*Lasioglossum s.s., (*incl. s.g. *Leuchalictus)*

—. Forewing with 2nd and 3rd transverse cubital vein(s) weakened, compared to the 1st; (weakened equally if there are two); T2–T3 with or without basal fascia 42

42(41). Two submarginal cells, *and* anterior face of T1 with diffuse appressed or subappressed hair patch on either side of midline……..... .....*Lasioglossum (Hemihalictus) lustrans* (Cockerell)

—. Three submarginal cells, usually no appressed or subappressed hair patch on anterior face of T1, although erect hairs may be present 43

43(42). Hind femoral scopa plumose ("feathery")..... .....*Lasioglossum* (non-metallic groups, *in part)*

—. Hind femoral scopa simple, sparse, comprised of a single row of hamate hairs or bristles, these reduced in size approaching apex of femur; Onagraceae specialists ..... *Lasioglossum (Sphecodogastra s.s., in part)*

44(34). Glossa bilobed and short (rarely, in southern portion of TGP and extreme southern US, deeply bifid with two long threadlike segments); 2nd recurrent vein usually "S"-shaped, rarely straight (again, straight only in southern portion of TGP and extreme southern US 45

—. Glossa variable, short and acute to very long and threadlike, but never bilobed; 2nd recurrent vein never "S"-shaped 46

45(44). Glossa short and bilobed; pygidial plate and basitibial plate absent; ocelli normal; 2nd recurrent vein "S"-shaped; size variable; common bees throughout the TGP/midwest region ..... *Colletes*

—. Glossa longer and narrower, deeply bifid with two long threadlike sections; pygidial plate and basitibial plate present; ocelli large; 2nd recurrent vein straight; large bees (15 mm or greater), rare in southern portion of TGP and extreme southern US ..... *Caupolicana*

46(44). Facial foveae present, varying from large, elliptical, velvety or fuzzy shallow depressions that parallel the inner eye margin, to small, hairless, triangular to roundish depressions adjacent to inner upper eye margin, these sometimes obscure and dot-like; two subantennal sutures always present but usually not obvious (Andrenidae) 47

—. Facial foveae absent (look carefully); usually only one subantennal suture, rarely two 56

47(46). Facial foveae paralleling inner eye margins and filled with short, velvet-like dense hairs (with longer hairs sometimes intermixed), the foveae usually broadly to narrowly oblong, sometimes narrowed below; marginal cell narrowed and more or less pointed apically; hind femoral scopa (and usually trochanteral and lateral propodeal scopa) always present; usually 3 submarginal cells, occasionally 2; glossa usually short and pointed [long and thread-like only in *A. violae* (Robertson)] ..... *Andrena*

—. Facial foveae without hairs, variable in shape; often narrowly oblong, sometimes almost linear, sometimes reduced to a small depression near margin of upper eye, sometimes obscure and dot-like; marginal cell apically truncate, often obliquely so; scopa restricted to hind tibia/basitarsi; usually 2 submarginal cells (3 sm cells in *Protandrena*,*s.s.* below); glossa variable but often long and narrow (*Panurginae*) 48

48(47). Forewing with three submarginal cells; 10 mm or larger; face (clypeus at least) marked at least in part with yellow or ivory; mid-tibial spurs long (as long as midbasitarsus) and finely serrate (closely serrate in upper portion, serrations more separated below) ..... *Protandrena* (*Protandrena*)

—. Forewing with two submarginal cells; size usually less than 10 mm; facial markings present or absent; mid-tibial spurs variable 49

49(48). Forewing with marginal cell short, its length usually about 2x its width or a bit longer, frequently not much longer than the stigma; head and thorax

usually dull greenish or bluish (rarely blackish), *usually* with yellow or whitish maculations, rarely bee entirely pale (yellowish or whitish) or entirely dark; abdomen usually with yellow/ivory maculations, sometimes limited to a few small dots, but sometimes abdomen all dark or reddish 50

—. Marginal cell of forewing usually longer, its length at least 3x its width; abdomen without maculations (but maculations may be present elsewhere on body); bee integument never greenish or bluish, never entirely pale yellow or white……..…….….51

50(49). Head and thorax usually dull metallic (blue to green to gold); abdomen usually with yellow or white maculations (these sometimes very small and dot-like); *if* head and thorax blackish or abdomen without maculae, *then* outer surface of the base of the mandible flat, without an arcuate groove; throughout TGP/ Midwest region…….*Perdita*

—. Head and thorax black, non-metallic, and abdomen reddish-brown to reddish, without maculae; outer face of base of mandible with an arcuate ridge or groove; rare bees, western and southern margins of TGP .....*Macrote*ra

51(49). Terga with pale apical fasciae; face (clypeus at least) with yellow or ivory maculations; forewing with stigma very small or very narrow or both, not much larger than prestigma (if at all) .....*Calliopsis*, *in part*

—. Terga without apical fasciae; face with yellow/ivory or not; stigma of forewing larger than prestigma 52

52(51). Face with much yellow (on clypeus, supraclypeal area in part, and subantennal areas); abdomen at least, and frequently parts of head and thorax, mostly reddish-orange; T2 lateral margin with large dark oval to circular "dot" (fovea); mid-tibial spurs long, as long as midbasitarsus, very finely serrate in apical third, simple below; scopa weak, hairs simple, sparse; *Monarda* specialist; southern TGP.....*Protandrena* (*Metapsaenythia*) *abdominalis* (Cresson)

—. Face usually without yellow maculae, *if* yellow (or whitish) present on face *then* restricted to clypeus and/or supraclypeal area and/or paraocular area; abdomen dark; T2 lateral margin with foveae small, often obscure or absent; mid-tibial spurs variable but not as above; scopa variable 53

53(52). Forecoxae each with a narrow hairy spinous process; scutum usually coarsely, densely punctate, and pleura pitted-reticulate; dorsal surface of propodeum usually pitted/reticulate; lateral surface of propodeum usually completely hairless .....*Protandrena* (*Pseudopanurgus*)

—. Forecoxae without a hairy spinous process; scutum and pleura more finely punctate; dorsal surface of propodeum variable, usually finely sculptured at least in part; lateral surface of propodeum usually with at least some obvious (often short) whitish hairs 54

54(53). Mid-tibial spurs long, usually as long as midbasitarsus, very thin, with 4–6 very fine, bristle-like, well-separated teeth in apical ½ or so; scopa often plumose (*i.e.*, @ 40x, hairs with branches, but these sometimes quite short)... *Protandrena* (subgenera *Pterosarus* and *Heterosarus)*

—. Mid-tibial spurs shorter than midbasitarsus, simple, without any teeth; scopa thin, hairs entirely simple, without barbs or branches (@40×).....55

55(54). Midbasitarsus short and broad (2–2.5 times as long as wide); scutum bare; clypeus rugoso-punctate; oligolege of *Passiflora lutea*……..… .....*Protandrena* (*Anthemurgus*) *passiflorae* (Robertson)

—. Midbasitarsus long and narrow, at least 3 times longer than wide; scutum with hairs; clypeus punctate with shiny interspaces .....*Panurginus*

56(46). Large (20 mm or slightly larger) robust hairy bees with two subantennal sutures and ocelli situated well below the vertex, near the antennal sockets (Oxaeinae); extreme southern TGP/Cross Timbers (Texas) 57

__. Usually smaller bees; one subantennal suture, rarely two; ocelli on or close to the vertex, not close to the antennal sockets 58

57(56). T5 laterally with long white hair tufts.... *Mesoxaea texana* (Friese)

__. T5 laterally without white hair tufts, the hairs short and golden.…..... .....*Protoxaea gloriosa* (Fox)

58(56). Two submarginal cells; uncommon to rare bees 59

—. Three submarginal cells 63

59(58). Apex of marginal cell removed from wing margin, and either obliquely truncate or rounded; stigma very narrow, only 2–3 times longer than prestigma; propodeum dorsal surface smooth and shiny……..... ..... *Calliopsis* (*Hypomacrotera*), *in part*

—. Apex of marginal cell pointed, and on wing margin or very nearly so 60

60(59). Antennae inserted below midline of face; propodeum with an obvious well-defined dorsal surface 61

__. Antennae inserted at midline of face; dorsal surface of propodeum merging with posterior face, not defined by a posterior margin 62

61(60). Abdomen dark; medium-sized bees, 8–10 mm; clypeus protuberant especially in lateral view; widespread ..... *Dufourea*

—. Abdomen reddish; very small bees, 4 mm or so; clypeus only slightly protuberant in lateral view; southern TGP, oligolectic on *Nama* species..... ..... *Sphecodosoma pratti* Crawford, *in part*

62(60). T1–T5 with complete whitish apical fascia, terga mostly dull; hind basitarsus slender and nearly as long as hind tibia; Asteraceae specialists.....*Hesperapis*

—. At most only T3–T4 with white apical fascia, and the fascia incomplete; tergal surfaces mostly very shiny; hind basitarsus short and broad, almost square; *Lysimachia* specialists .....*Macropis*

63(58). Antennae inserted below midline of face; very small bees, 4 mm or so, abdomen reddish; southern TGP, oligolectic on *Nama* species .... *Sphecodosoma pratti* Crawford, *in part*

__. Usually larger bees; *if* very small, then abdomen either dark or metallic, never reddish 64

64(63). Tegula with inner posterior margin angulate or lobate; propodeum with dorsal surface well-defined but very short, much shorter than scutellum; femoral scopa present 65

—. Tegula variable but not posteriorly angulate or lobate; propodeum either without a dorsal surface (entire propodeum vertical or nearly so), *or* propodeum with dorsal component long, about as long as scutellum; femoral scopa usually absent 66

65(64). Apical margins of terga with colored integumental "mother-of-pearl" bands... .....*Nomia*

—. Apical margins of terga dark or with white fasciae, never with colored integumental bands.....*Dieunomia*

66(64). Glossa short (about 3x as long as wide); propodeum with dorsal surface present; rare Ericaceae (*Vaccinium, Lyonia*) specialists; no Midwest or TGP records to date .....*Melitta*

—. Glossa usually longer and propodeum vertical or mostly so, lacking a distinct dorsal surface 67

67(66). T6 apical margin apiculate (with a minute point), but without a pygidial plate; blue or greenish, very rarely shiny black; 10 mm or less in length; clypeus usually with a whitish or yellowish macula, occasionally dark.....*Ceratina*

—. Integument usually dark; size variable, but usually > than 10 mm; T6 rounded apically, not drawn to a fine point, and pygidial plate present, its shape varying from extremely narrow to very broad; clypeus rarely maculated 68

68(67). Large bees, 16–20 mm or more; marginal cell very long and narrow, its length 8x or more its width; clypeus very flat; pygidial plate extremely narrow, almost linear ..... *Xylocopa*

—. Size variable but rarely 20 mm or more; marginal cell variable, occasionally narrow but never 8x as long as broad; clypeus variable but usually at least weakly convex, *if* flat then bee small (< 8 mm); pygidial plate broader, more or less triangular 69

69(68). Apex of marginal cell on wing margin, not bent away from wing margin; mandible with small preapical tooth; T1 anterior surface and dorsal surface evenly confluent, not separated by a weak carina or raised line; species superficially resembling a small bumble bee ..... *Habropoda*

—. Apex of marginal cell "free", bent away from wing margin, sometimes only slightly so; mandible variable, but usually without a preapical tooth (exceptions occur); T1 anterior surface and dorsal surface often separated by a weak carina or raised line; bee appearance occasionally bumble bee-like..... 70

70(69). Vertex rounded (*i.e.*, weakly convex) in facial view, not flattened; penicillus absent (penicillus is a paintbrush-like tuft of hairs at the apex of the hind basitarsus, also called the basitarsal brush); pygidial plate broadly expanded at very base, narrowing apically 71

—. Vertex flattened; penicillus usually present; pygidial plate variable..... 74

71(70). Small bees, about 6–7 mm; paraocular carina inconspicuous but present and complete; T2–T4 with narrow, entire white apical fascia, T1 fascia present but divided medially, and T5 fascia all brownish; scopa on hind tibia and basitarsi black and white, the hairs all plumose; Great Plains *Ipomoea* specialist, no records from TGP or midwest to date ..... *Ancyloscelis sejunctus* Cockerell

—. Usually larger bees; paraocular carinae absent or present only along lower eye margin; apical fasciae present or absent; scopal hairs either all black or all pale, not a mixture 72

72(71). Glossa very long, half as long as body length or longer; T2–T4 with narrow, entire white apical fascia, T1 lacking fasciae; T5 medio-apical margin usually with a small tubercle-like "tuft" of blackish hairs; scopal hairs all black; *Ipomoea* specialist ..... *Melitoma*

—. Glossa shorter, much shorter than body length; T2–T4 white apical fascia present or absent; scopal hairs either black or pale; T5 without a medio-apical "tuft" 73

73(72). Superficially resembling a small bumble bee; scopal hairs all black; tergal fasciae completely absent, abdomen pubescence largely black (but T1–T2 can be pale or yellowish in part); arolia absent; mandible often with very small preapical tooth; *Hibiscus* specialist, characteristic of wetlands but also occasionally found at Rose-of-Sharon and okra plantings ..... *Ptilothrix bombiformis* (Cresson)

—. Not resembling a small bumble bee; scopa pale (blonde to light gray); abdominal pubescence largely pale; arolia present; T2–T4 usually with pale fasciae but fasciae often broad or somewhat diffuse, not necessarily confined to apical margins, often worn away in part; specialists of Asteraceae, *Callirhoe* or *Opuntia*..... *Diadasia*

74(70). Marginal cell short, extending only slightly beyond the 3rd submarginal cell; wings strongly papillate apically (beyond venation); pygidial plate narrowly triangular, about 2x as long as broad or longer, not broadly expanded at base; T1 anterior surface and dorsal surface evenly confluent, not separated by a weak carina or raised line..... 75

—. Marginal cell usually extending distinctly beyond the 3rd submarginal cell; wings weakly and finely papillate apically; pygidial plate more broadly

triangular, usually about as broad as long; T1 anterior surface and dorsal surface usually separated by a weak carina or raised line, this sometimes faint and obscured by hairs 76

75(74). First submarginal cell longer than second; arolia present; mandible either simple, with a preapical tooth, or with a tridentate apex; hind tibial scopal hairs mostly simple; common throughout TGP and midwest..... *Anthophora*

—. First submarginal cell shorter than second; arolia absent; mandible with four apparent teeth; hind tibial scopa extremely dense, hairs plumose; rare, mostly extralimital ..... *Centris*

76(74). F1 very short, much shorter than scape; clypeus usually flattened; penicillus present but quite small; paraocular carina absent; small, robust, rare bees, < 8 mm 77

—. F1 longer, at least ½ as long as scape or longer; clypeus convex, but sometimes weakly so; penicillus larger; paraocular carina present; bees usually 10 mm or more in length (Eucerini) 78

77(76). Hind basitibial plate very large, almost the size of tegulae; extralimital species ..... *Exomalopsis*

—. Hind basitibial plate small, much smaller than tegulae; rare in our region..... ..... *Anthophorula*

78(76). Tegulae teardrop-shaped, its posterior portion rounded but its anterior portion narrowed, weakly concave or incurved along the narrowed margin, and usually hidden in part by pubescence; common bees..... *Melissodes, in part*

—. Tegulae more-or-less rounded or oblong throughout, anterior portion similar in shape to posterior portion (*i.e.*, tegulae not narrowed anteriorly)..... 79

79(78). Clypeus with apical margin *weakly* trilobate; scopal hairs dark, with weak, short, sparse branches; terga extremely finely, densely punctate throughout, uniformly so all the way to tergal margins, at least T2–T3 largely covered with extremely fine, short appressed hairs; outer margin of mandible medially angulate; *Ipomoea* specialist, uncommon .... *Xenoglossa* (*Cemolobus*) *ipomoeae* (Robertson)

—. Clypeal margin entirely straight across (entire), margin not lobed or sinuate; T1 usually with a line or weak carina separating dorsal and anterior surfaces; other characters variable 80

80(79). At least T2 and T3 (and often T4) with pale apical fasciae 81

—. T2–T4 without discrete apical fasciae, but may have sub-apical, medial or basal fasciae, or terga may be largely covered with pubescence, or terga may be largely bare 84

81(80). T2 and T3 with discrete apical and basal fascia, T4–T5 covered with appressed pale pubescence; clypeus yellow in apical half, this maculation usually with a medial point directed towards the supraclypeal area; hind tibial scopal hairs highly plumose ..... *Xenoglossa* (*Xenoglossodes*) *eriocarpi* (Cockerell)

—. T2, T3 *and* T4 with pale apical fasciae 82

82(81). Sternal scopa long and dense, *Megachil*e-like; hind tibial scopa highly plumose, each hair with numerous fine short branches; T2–T5 very densely and finely punctate ..... *Xenoglossa (Xenoglossodes) spissa* (Cresson)

—. Sternal hairs much reduced, hind tibial scopal hairs entirely simple, or with few long branches 83

83(82). Hind tibial and basitarsal hairs with few long branches; clypeal apical margin with a pair of narrow pale yellow maculae .... *Epimelissodes* (*Brachymelissodes*) *cressonii* (Dalla Torre)

—. Hind tibial and basitarsal hairs entirely simple, without branches; clypeal apical margin dark, unmaculated .... *Xenoglossa* (*Xenoglossodes*) *cressoniana* (Cockerell)

84(80). Hind tibial scopal hairs entirely simple, without branches 85

—. Hind tibial scopal hairs with at least some branches, often highly plumose...89

85(84). T2–T3 largely covered with whitish tomentum, obscuring integument (but tomentum often worn away in part), and not forming discrete fasciae; sternal hairs very short, uniform; Fabaceae (primarily *Dalea*) oligolege..... *Xenoglossa* (*Xenoglossodes*) *albata* (Cresson) [Note: *X. (X.). paenalbata* (LaBerge), a recently described central Great Plains species, has been found in NW Missouri and SW Iowa on loess hill prairies at *Dalea eneandra*; it is easily mistaken for *X. albata,* but has a more extensive sternal scopa including some weakly hamate hairs on S3–S5, and larger, more separated punctures on T1, with a slightly longer apical impunctate area.]

—. T2–T3 with medial, subapical or basal fasciae (sometimes bare), the apical rims of T2–T3 exposed and without pubescence, rims varying from broad to extremely narrow.....86

86(85). Large bee, 16 mm or more; T2 with complete medial fascia, the fascia very narrow, about equal in length to the length of the post-fascia apical area; lower lateral margin of clypeus in contact with margin of the eye; tergal punctation extremely fine and dense, impunctate apical margins extremely narrow; blade of galea slightly shorter than head length; rare O*enothera* specialist..... ..... *Epimelissodes* (*Anthedonia*) *comptus* (Cresson)

—. T2 lacking complete medial fascia and lower lateral margin of clypeus distinctly separated from eye margin; galea usually obviously as long or longer than head length; mostly common species 87

87(86). Labrum and apical margin of clypeus (sometimes apical half of clypeus) yellow to pale orange; upper *inner* margin of mandible near base with a small tooth or angle (mandibles must be opened to see this); T2 without subapical fascia (scattered tomentum may be present, but not forming a defined band); Cucurbitaceae specialists.....*Xenoglossa* (*Xenoglossa*)

—. Labrum and clypeus dark, unmaculated; upper inner margin of mandible simple, without a tooth or angle; T2 sometimes with a band of subapical fascia 88

88(87). Apex of mandible weakly notched (unless worn); maxillary palps with 5 segments; T2 with subapical fascia (whitish), this usually complete or nearly so; hind tibial scopa hairs light brown; Cucurbitaceae specialists..... .....*Xenoglossa* (*Peponapis*)

—. Apex of mandible simple, without a notch; maxillary palps with 6 segments; terga variable, sometimes with white fasciae, sometimes all or mostly dark, rarely all orange; hind tibial scopa color variable: golden, orangish, white, or dark; flight period spring-early summer .....*Eucera* (*Synhalonia*)

89(84). Mouthparts (especially the prementum ventrally) with dense hamate hairs (light or dark in color); T1–T3 uniformly punctate except for their narrow impunctate apical margins; pleura with a central patch of white hairs bordered by blackish hairs; T4 covered with dense white appressed hairs except for an apicomedial-patch of black hairs; usually associated with wetlands and *Pontedaria*.....*Florilegus condignus* (Cresson)

—. Mouthparts without any hamate hairs; pleura hairs uniform in color, either all light or all dark; T4 apical pubescence usually either all pale or all dark.....90

90(89). T1 with sparse, scattered punctures even on basal portion, T1 hairs very sparse; tibial scopa hairs very sparse and light-colored, with few long branches; rare bee, oligolectic on *Callirhoe,* Osage Plains and southern TGP..... .....*Melissodes intortus* Cresson

—. T1 densely and finely punctate in basal portion at least, punctures on basal portion often partly obscured by dense hairs; tibial scopa hairs very dense, usually highly plumose and pale in color, but all black in one species..... ..... *Epimelissodes* (*Epimelissodes*)

MALES

91(1). Two submarginal cells 92
—. Three (very rarely one) submarginal cells 126
92(91). Black and yellow bees (rarely all black), 8 mm or less, sparsely-hairy compared to most bees; glossa very short, blunt or weakly bilobed, not pointed; face usually mostly yellow, scape often marked with yellow, but abdomen entirely unmaculated; marginal cell apically pointed on wing margin...*Hylaeus*
—. Usually obviously hairy bees, but hairs occasionally sparse; glossa longer, pointed to almost threadlike, never blunt or bilobed; *if* face partly or mostly yellowish, *then* the marginal cell is either apically truncate or rounded, and/or the abdomen is maculated in part....93
93(92). Marginal cell apically truncate, sometimes obliquely so, rarely (some *Calliopsis*) almost rounded; face usually with some yellow/ivory maculae, sometimes extensive, occasionally maculations present on thorax and abdomen as well; facial foveae sometimes present but small, linear to oblong to dot-like, often obscure, and without pubescence (Panurginae) 94
—. Marginal cell apically pointed to rounded, but not truncate; maculations sometimes present on face and elsewhere; facial foveae absent 101
94(93). Forewing with marginal cell short, its length usually about 2x its width or a bit longer, frequently not much longer than the stigma; small bees, around 8 mm or less; head and thorax usually dull greenish or bluish, often with yellow or whitish maculations, these sometimes extensive, rarely bee entirely pale (yellowish or whitish) or entirely dark; abdomen usually with yellow/ivory maculations, sometimes limited to a few small dots, but sometimes abdomen all dark or reddish 95
—. Marginal cell of forewing much longer than stigma; abdomen without maculations (but maculations may be present elsewhere on body); bee head and thorax usually dark (except for any maculations), never greenish or bluish, never entirely pale yellow or white 96
95(94). Head and thorax usually dull metallic (blue to green to gold); abdomen usually with yellow or white maculations (these sometimes very small and dot-like); *if* head and thorax blackish or abdomen without maculae, *then* outer surface of the base of the mandible flat, without an arcuate groove; throughout TGP/Midwest region .... *Perdita*
—. Head and thorax black, non-metallic, and abdomen reddish-brown to reddish, without maculae; outer face of the base of the mandible with an arcuate groove; western and southern margins of TGP....*Macrote*ra
96(94). Abdomen mostly orangish; face all yellow below level of antenna; legs largely yellow ....*Protandrena* (*Metapsaenythia*) *abdominalis* (Cresson)
—. Abdomen dark; yellow on face and legs variable....97
97(96). Clypeus *and* paraocular areas yellow, at least in part (maculations may occasionally be small) 98
—. Clypeus yellow, but paraocular areas and rest of face dark ....*Panurginus*
98(97). All tibia dark, unmaculated; hind tibial margin in profile coarsely serrate.... ....*Protandrena* (*Anthemurgus*) *passiflorae* (Robertson)
—. Tibia usually maculated with yellow at least in part, or at least ferruginous; hind tibial margin entire, not coarsely serrate 99
99(98). Very coarsely punctate bees throughout; wings very dark ....*Protandrena* (*Pseudopanurgus*)
—. More finely punctate bees; wings lighter 100
100(99). Stigma length along wing margin at most only ½ the length of marginal cell along wing margin .... *Calliopsis*

—. Stigma length along wing margin nearly as long as length of marginal cell along wing margin ..... *Protandrena* (*Pterosarus* and *Heterosarus* subgenera)

101(93). Mandible bidentate, *or* with three or more teeth, *or* with a baso-ventral toothlike or angular process; mandible often broadened from base to apex.....102

—. Mandible either simple and pointed apically, or with a small preapical tooth set back from the pointed apex; mandible narrow from base to apex 118

102(101). Maculations (white to yellow or reddish) present on head, thorax or abdomen (or all three), usually very obvious but in a few cases present only as a series of small dots on terga 103

—. Integument lacking any maculations, although whitish or yellowish bands or patches of hair may be present 110

103(102). Pygidial plate present; clypeus and usually paraocular areas yellow, at least in part, rest of body all dark.....*Macropis, in part*

—. Pygidial plate absent; thorax and/or abdomen usually with maculations.....104

104(103). Omaulus carinate, at least in dorsal (upper) portion.....105

—. Omaulus not carinate, but rounded instead 106

105(104). Metanotum with lateral (or medio-lateral) hair tufts (pale brown); scutellum with posterior margin out-curved (*i.e.*, convex); pronotal lobe with broad lamella; scutum anterior margin sharply truncate above pronotum..... .....*Dianthidium in part*

—. Metanotum without any hair tufts; scutellum with posterior margin straight; pronotal lobe with reduced carina, not lamellate; scutum anterior margin evenly confluent with pronotum..... *Anthidiellum*

106(104). Arolia absent [Note: males of the introduced *Pseudoanthidium nanum* (Mocsáry) also lack arolia, and have been found recently in the upper Midwest; they can be separated from all *Anthidium* species by the front femur being ventro-basally angulate (rounded in all *Anthidium* species), the lamellate pronotal lobe (present only in *A. oblongatum*), and their small size (5–6 mm)].... ..... *Anthidium*

—. Arolia present.....107

107(106). Either mandibles and/or clypeus black, without maculae; propodeum usually with dorsal component (often very narrow), at least in part ..... *Stelis*

—. Mandibles and/or clypeus maculated, at least in part; propodeum entirely vertical 108

108(107). Ocelli large, their diameter slightly greater than the diameter of an antennal socket; large bees, 12 mm or greater ..... *Trachusa*

—. Ocelli quite small, their diameter smaller than diameter of an antennal socket; smaller bees, 12 mm or less 109

109(108). T7 laterally with a pair of broad lobes; clypeal margin strongly denticulate; upper portion of omaulus weakly carinate.....*Dianthidium texanum* (Cresson)

__. T7 laterally with a pair of small teeth; clypeal margin very slightly denticulate; upper portion of omaulus rounded.....*Paranthidium jugatorium* (Say)

110(102). Eyes densely hairy; axillae produced as triangular, pointed or spine-like processes; T6 usually with a "cluster" (6–8) of spine-like projections...*Coelioxys*

—. Eyes essentially bare, not densely hairy; axillae not produced as triangular or spine-like processes; T6 without a "cluster" (6–8) of projections but may have a carina, carina may be denticulate or bidentate.....111

111(110). Pygidial plate present; forecoxae simple, without spines or projections; ventral margin of mandible simple.....112

—. Pygidial plate absent 113

112(111). Arolia absent; rare introduced species.....*Lithurgus chrysurus* Fonscolombe

—. Arolia present; native species .....*Lithurgopsis*

113(111). Arolia absent; forecoxae often with spines or projections; mandible often with ventral tooth or angle ..... *Megachile*
—. Arolia present 114
114(113). Parapsidal lines dot-like (punctiform), hardly longer than broad, sometimes difficult to see; metallic dull blue, dull green or dull goldish bees, rarely brilliant green, rarely all black ..... *Osmia*
—. Parapsidal lines linear, short to long; integument dark, without any metallic color 115
115(114). T1 anterior surface transitioning abruptly to T1 dorsal surface, the anterior surface broadly concave (dish-shaped) to flattened, and separated from dorsal surface by a weak line or rim 116
—. T1 anterior surface transitioning gradually to the dorsal surface, convex or only slightly flattened, T1 anterior surface not separated from dorsal surface by a weak line or rim 117
116(115). Omaulus carinate, anterior face of mesopleura smooth and shiny, in contrast to the punctate lateral face ..... *Ashmeadiella*
—. Omaulus not carinate, anterior face of mesopleura similar in sculpture to the lateral face; T1 with a raised rim separating anterior and dorsal surfaces; strongly punctate, bullet-shaped bees ..... *Heriades*
117(115). Lateral margin of T6 with a small to very small tooth, spine or angle; propodeum without a dorsal component; head lacking preoccipital carina; flagellar segments often modified, often not moniliform ..... *Hoplitis*
—. Lateral margin of T6 simple, without a small tooth, spine or angle; propodeum either with a narrow, reticulate dorsal component, *or* head with a preoccipital carina; flagellar segments always moniliform ..... *Chelostoma*
118(101). Clypeus all or mostly yellow, *and* paraocular areas yellow at least in part; rest of face and head dark; thorax and abdomen dark 119
—. Clypeus and parocular areas variable, usually without yellow, but *if* yellow in part, *then* thorax and/or abdomen and/or other parts of head reddish or yellowish in part 120
119(118). Hind basitarsi long and narrow, 8–10 times as long as broad, almost as long as tibia; mandibles long and sickle-like ..... *Andrena* (*Parandrena*)
—. Hind basitarsi short, 2–3 times as long as broad, much shorter than tibia; mandibles short, approaching bidentate condition ..... *Macropis, in part*
120(118). Basal vein arched, sometimes weakly so; propodeum with distinct dorsal (horizontal) component 121
—. Basal vein straight; propodeum vertical or nearly so, without a dorsal component 124
121(120). Head and thorax dull metallic green or blue (occasionally with pale yellow or dull orange maculae on clypeus and/or pronotal lobes and basitarsi ..... *Lasioglossum* (*Dialictus*)
—. Head and thorax with dark integument, not dully metallic, not blue or greenish; abdomen sometimes reddish/orangish; clypeus and basitarsi occasionally maculated 122
122(121). Mandibles as long as eye, sickle-like, without preapical tooth ..... *Lasioglossum* (*Hemihalictus*) *lustrans* (Cockerell)
—. Mandible shorter than eye, sometimes with preapical tooth 123
123(122). Most or all of clypeus extending below suborbital line; F2 2–3 times as long as broad; antenna situated slightly below midline of face ..... *Dufourea*
—. Clypeus extending below suborbital line no more than half its length; F2 usually not more than twice as long as broad; antenna situated at midline of face ..... *Sphecodes, in part*

124(120). Terga with complete whitish apical fasciae; body without any maculae or patches of appressed pubescence (other than tergal fasciae); pygidial plate finely pointed at apex.....*Hesperapis*

—. Terga without apical fasciae; head, thorax or abdomen with yellow or red maculae, or patches of appressed tomentum; pygidial plate not finely pointed at apex.....125

125(124). Labrum short, rectangular, about twice as broad as long, never longer than broad; head, thorax and abdomen usually maculated to some degree with yellowish or reddish colors, occasionally bee all red with some black; size variable, but often greater than 6 mm; antennae (including scape and pedicel) with 13 segments; common bees .....*Nomada in part*

—. Labrum long, at least twice as long as broad, tapering towards apex; head, thorax and/or abdomen decorated with patches of pale tomentum, abdomen often reddish; 6 mm or less; antennae (including scape and pedicel) with 12 segments; uncommon bees..... *Holcopasites*

126(91). Head and thorax (and usually abdomen) bright green [Note: One species of *Euglossa* (*E. dilemma* Bembe and Eltz) has been found recently in peninsular Florida, and may eventually be found in the coastal prairie areas of Louisiana and Texas. Any male *Euglossa* would come to this couplet; all are strikingly green/blue/purple/ with a white labrum and a very long tongue.] 127

—. Head, thorax and abdomen never bright green, usually dark, occasionally dull metallic green or blue.....130

127(126). Posterior face of propodeum encircled by a strong carina; abdomen with black and yellow bands.....*Agapostemon*

—. Posterior face of propodeum not encircled by a carina, at most carinae present only laterally; abdomen all greenish, without yellow or black bands.....128

128(127). Tegula asymmetric, not entirely circular or oval, but with a process or angle on the inner posterior margin; posterior face of propodeum bordered by a carina on each side that terminates shortly before reaching dorsal surface; hind tibia all or nearly all green .....*Augochloropsis*

—. Tegulae entirely oval to roundish, without a process or angle on inner posterior margin; posterior face of propodeum either without lateral carinae or carinae only reaching part way towards dorsal surface; hind tibia yellowish or reddish-brown in part, not all green 129

129(128). Posterior and lateral faces of propodeum closely, distinctly punctate; S4 apical margin entire.....*Augochlora pura*

—. Posterior and lateral faces of propodeum rugose to rugoso-punctate, punctures obscure; S4 apical margin concave, but often weakly so (compare to S3, which is entire) .....*Augochlorella*

130(126). Terga (at least T2–T4) with iridescent ("mother-of-pearl") apical bands, otherwise dark.....*Nomia*

—. Terga without iridescent bands, but may have hair bands or hair patches...131

131(130). Propodeum with a dorsal, horizontal component, clearly visible in dorsal view, though occasionally this may be very narrow; *if* propodeum nearing vertical but without a distinct horizontal component, *then* marginal cell apically truncate, *or* lower half of face yellow 132

—. Propodeum without a distinct horizontal component, entirely vertical or approaching vertical; marginal cell pointed or rounded, never truncate; yellow on face, if present, usually restricted to clypeus, occasionally more extensive.....144

132(131). Tegula asymmetric, not entirely circular or oval, but with a posterior process or angle; propodeum with horizontal surface very narrow, much narrower than scutellum; medium to large bees, 8–16 mm.....*Dieunomia*

—. Tegulae usually symmetric (circular to oval), usually without a posterior process or angle; propodeum with horizontal surface broader, usually about as broad as scutellum; size variable, but often less than 8 mm.....133
133(132). Basal vein arched; pygidial plate usually absent.....134
—. Basal vein straight; pygidial plate present or absent.....140
134(133). Terga with pale apical fasciae; hind tibia usually yellow medially, in part; apical portion of clypeus yellow.....*Halictus*
—. Terga without pale apical fasciae, though basal fasciae may be present; hind tibia usually without yellow except at extreme base and apex; apical portion of clypeus variable in color.....135
135(134). Head and thorax dull green or dull blue, sometimes weakly so; occasionally with pale yellow or dull orange markings on clypeus apically, and/or on tarsi .....*Lasioglossum* (*Dialictus*)
—. Head and thorax dark, blackish or brownish, not dull metallic; occasionally with yellow maculae on clypeus and/or legs 136
136(135). Apical portion of clypeus and/or basitarsi yellowish, at least in part 137
—. Clypeus all dark; basitarsi occasionally weakly pale, rarely yellowish.....138
137(136). Abdomen entirely orange-ish *and* ocelli greatly enlarged, almost as large as tegulae.....*Lasioglossum* (*Sphecodogastra, in part*)
—. Ocelli usually small (*i.e.*, "normal"), but *if* enlarged, then abdomen all dark.. .....*Lasioglossum* (*non-metallic groups, in part*)
138(136). Tiny bees, 3–4 mm; antennae located below midline of face; S7 bilobed; dorsal surface of gonocoxites smooth.....*Sphecodosoma*
—. Size variable, usually larger; antennae located at midline of face; S7 simple, not bilobed 139
139(138). Sterna with sparse, usually very short scattered simple hairs; clypeus not extending more than half its length beyond suborbital line; abdomen variable, from reddish-orange all or in part, to all black; dorsal surface of gonocoxites usually coarsely to finely striate ..... *Sphecodes in part*
—. Sterna (at least S2–S4) with long erect hairs, often curly or weakly plumose, usually in some sort of pattern; clypeus often extending half its length or more beyond suborbital line; abdomen all dark; dorsal surface of gonocoxites usually smooth .....*Lasioglossum* (*non-metallic groups, in part*)
140(133). Second recurrent vein weakly "S"- shaped; glossa very short and bilobed; pygidial plate absent; inner margins of eyes usually converging below..... .....*Colletes*
—. Second recurrent vein straight; glossa simple, short or long, very rarely deeply divided into two threadlike segments; pygidial plate sometimes present; eyes with inner margins parallel, not converging below 141
141(140). Ocelli greatly enlarged; F1 long, as long as F2+3+4+5; glossa deeply divided into two narrow, long filaments; large hairy bees, 16 mm or more; rare..... .....*Caupolicana*
—. Ocelli normal; F1 shorter; glossa simple, short, like a small pointed paintbrush (one exception); usually smaller than 16 mm 142
142(141). Marginal cell apically truncate; lower half of face all yellow ....*Protandrena* (*Protandrena*), *in part*
—. Marginal cell apically pointed or very narrowly rounded; face usually all dark, sometimes clypeus and paraocular areas yellow, occasionally lower half of face yellow.....143
143(142). Hind wing with jugal lobe much longer than vannal lobe; basitibial plate distinct; face usually dark but occasionally with yellow or ivory maculae..... .....*Andrena, in part*
—. Hind wing with jugal lobe about half as long as vannal lobe; basitibial plate obscure or absent, not well-defined; face always dark, without maculae; Ericaceae specialists (*Vaccinium, Lyonia)*, no Midwest or TGP records...*Melitta*

144(131). Very small bee (4 mm or less), with only one submarginal cell; marginal cell minute, shorter than the single submarginal cell; bee often covered with pale yellowish appressed pubescence; very rare, in sandy habitats.....*Neolarra*

—. Usually larger, with three submarginal cells; marginal cell longer than any single submarginal cell; appressed pubescence often absent on abdomen, *if present* then it forms a distinct pattern, not a uniform covering 145

145(144). Abdomen relatively hairless and maculated with red, and/or yellow, and/or black, rarely abdomen all red; *or* abdomen all dark and extensively hairy with erect to suberect blackish hairs and scutellum with a pair of spinose tubercles 146

—. Abdomen usually without integumental maculations, but *if* terga have ivory-colored apical integumental bands, *then* thorax very hairy and face extensively maculated with yellow or ivory (if so, see *Anthophora*, couplet 159).....148

146(145). Bee integument (especially abdomen) colored with some combination of red, yellow, white, black, rarely all red or all black; bees often relatively hairless, integument easily seen, not obscured by hair 147

—. Bee integument all blackish and quite hairy, hairs obscuring integument in part; mandible simple apically, but with a single tooth/angle located on inner surface midway between base and apex of mandible; scutellum with pair of small spinose tubercles, one on either side of midline, usually hidden by dense pubescence; rare bee; 10–12 mm .....*Melecta pacifica* Cresson

147(146). Head *and*/*or* thorax *and*/*or* abdomen usually maculated with yellow, red or white; size variable, 4–15 mm; hind femur ventrally simple; maxillary palps more than half as long as blade of galea; common bees throughout TGP/Midwest .....*Nomada in part*

—. Head and thorax black, abdomen red at least in part, bee 6 mm or less; hind femur ventrally with a thornlike projection; maxillary palps less than half as long as blade of galea; rare bees, central and southern TGP.....*Brachynomada*

148(145). Bees with few or no long hairs, instead with bands, partial bands, or other patterns of appressed pale pubescence (especially on abdomen), and clypeus without yellow 149

—. Bees usually with abundant long hairs at least over most of the head and thorax, without_bands, partial bands, or other patterns of appressed pale pubescence except for apical fasciae, *or* bee integument dull metallic blue or greenish; clypeus often yellowish at least in part 153

149(148). Pygidial plate present, apex rounded 150

—. Pygidial plate absent, instead T7 apicomedially bidentate, shallowly or deeply so 152

150(149). Eyes strongly convergent above, lateral ocelli less than one ocellar diameter from inner eye margin; mandible with preapical tooth; posterior face of propodeum without punctures or macrosculpture, very shiny; very rare parasite of *Macropis* .....*Epeoloides*

—. Eyes not or little convergent above, lateral ocelli more than one ocellar diameter from inner eye margin; mandible simple apically, without preapical tooth; posterior face of propodeum with some amount of sculpturing, shiny only in part if at all 151

151(150). Maxillary palps two-segmented, very inconspicuous; inner margin of mandible medially often with an angle or tooth; usually less than 10 mm.....*Epeolus*

—. Maxillary palps three-segmented, conspicuous, easily seen; inner margin of mandible medially without an angle or tooth; usually greater than 10 mm..... .....*Triepeolus*

152(149). Mid-tibial spur bifid or forked apically; scutellum without teeth or projections; inner margin of mandible at most with one small tooth or angle; rare, central and southern TGP ..... *Ericrocis*
—. Mid-tibial spur simple; scutellum dorsally with two broad teeth separated by a shallow groove; inner margin of mandible medially with two small teeth; widespread species ..... *Brachymelecta*
153(148). Marginal cell very long and narrow, its length 8x or more its width; large bees, around 14–20 mm.....154
—. Marginal cell shorter; *if* 8x or more in length, *then* eyes very hairy and tibial spurs absent 156
154(153). Very large, robust bees; lower half of face yellow/ivory; abdomen with a metallic sheen, thorax clearly visible .....*Xylocopa*
—. Not as large or robust, face all dark, abdomen all dark, thorax entirely covered by hair; southern TGP and Cross Timbers.....155
155(154). S8 apically emarginate; S6 with conspicuous white hair tufts laterally…..... .....*Mesoxaea*
—. S8 apically entire; S6 without white hair tufts laterally .....*Protoxaea*
156(153). Dull metallic blue, green or rarely shiny black bees (T6 apico-medically with a small pubescent "tuft", or T7 broadly bidentate); relatively hairless, less than 10 mm .....*Ceratina*
—. Integument dark, not bluish or greenish; mostly very hairy bees; size variable 157
157(156). Paraocular areas yellow or ivory, at least in part; scape often marked with yellow or ivory 158
—. Paraocular areas all dark, scape unmarked 160
158(157). Mandible with three teeth; marginal cell short, shorter than distance from its apex to apex of wing; 2nd submarginal cell longer than the other two; stigma minute; extralimital .....*Centris*
—. Mandible simple or with a single preapical tooth; marginal cell short but not as short as in *Centris*; 2nd submarginal cell more-or-less equal in length to the others; stigma slightly larger.....159
159(158). S6 flat, not reflexed downward apically; labrum and mandible yellow or mostly so, *or* hind basitarsi angulate or toothed ..... *Anthophora*
—. S6 medio-apically reflexed downward; labrum and mandible variable; hind basitarsi parallel-sided, not angulate or toothed ..... *Habropoda*
160(157). Eyes very hairy; hind tibial spurs absent.....*Apis mellifera* Linnaeus
—. Eyes without hairs, or with extremely minute hairs; hind tibial spurs present 161
161(160). Mandible ventral margin with fringe of long, usually curly hairs; scape at least as long as length of F1–F3 combined; bumble bees .....*Bombus*
—. Mandible ventral margin without fringe of long, usually curly hairs; scape much shorter, never as long as F1–F3 combined 162
162(161). Clypeal margin trilobed; F1 and F2 of equal length or very nearly so; uncommon species.....*Xenoglossa* (*Cemolobus*) *ipomoeae* (Robertson)
—. Clypeal margin entire; F1 usually shorter than F2 163
163(162). T7 laterally with an angulate, tooth-like projection, often partly concealed by hairs 164
—. T7 laterally without an angulate flange or tooth (do not mistake T6 for T7; T6 often has a lateral tooth-like projection).....166
164(163). Tegula teardrop-shaped, narrowing apically, broadened posteriorly, sometimes weakly concave on apical half, apical half usually partly concealed by pubescence .....*Melissodes in part*
—. Tegula rounded to oblong, not tapering anteriorly, or S6 with a broad medial ridge, flattened on either side 165

165(164). F1 much shorter than F2; abdomen with much dark pubescence..... .....*Florilegus condignus* (Cresson)
—. F1, F2 and F3 all of equal length; abdomen with all pale pubescence..... .....*Melissodes intortus* Cresson
166(163). Vertex convex (*i.e.*, weakly or gently rounded, in facial view), *or* hind femur greatly enlarged 167
—. Vertex flattened or weakly concave 170
167(166). Arolia absent; pubescence black and yellow, superficially resembling a small bumble bee..... *Ptilothrix bombiformis* (Cresson)
—. Arolia present; pubescence otherwise, not superficially resembling a small bumble bee 168
168(167). Glossa very long, about half as long as body or longer; F1 length equal to scape length ..... *Melitoma*
—. Glossa shorter, little longer than head at most; F1 1/3 length of scape or less..169
169(168). Hind femur grossly enlarged, greatly inflated; mandible yellow basally; propodeal triangle hairy; small bees, approximately 7 mm; no TGP/Midwest records to date..... *Ancyloscelis sejunctus* Cockerell
__. Hind femur not enlarged or inflated; mandible all dark; propodeal triangle mostly hairless, smooth; size variable, but mostly larger bees.....*Diadasia*
170(166). Marginal cell obliquely truncate; small bees (6 mm or so) 171
—. Marginal cell apically either pointed or rounded; larger bees, 10 mm or larger.....172
171(170). Clypeus yellow.....*Anthophorula*
—. Clypeus all dark .....*Exomalopsis*
172(170). Hind basitibial plate absent or very obscurely developed; glossa short and pointed; eastern species, no records from the Midwest or TGP region..... .....*Melitta in part*
—. Hind basitibial plate present, well-developed; glossa much longer, threadlike 173
173(172). F1 equal in length to scape or slightly longer, and longer than F2; *inner* margin of mandible with tooth or sharp angle; T6 laterally with conspicuous angulate projection .....*Xenoglossa* (*Xenoglossa*)
—. F1 shorter than scape and either shorter than, or rarely equal, to F2; inner margin of mandible simple; T6 lateral projection usually inconspicuous, or absent.....174
174(173). F1 and F2 of equal or near-equal length.....175
—. F1 clearly shorter than F2 176
175(174). T2–T4 white fasciae located sub-medially, not apically, T5 without fasciae; apical flagellar segment (F11) attenuate and curved; large (13–15 mm), rare bees..... *Epimelissodes* (*Anthedonia*) *comptus* (Cresson)
—. T2–T4 white fasciae located apically, T5 also with apical fasciae; F11 straight, rounded apically, scape all yellow ventrally; smaller bees (12 mm)..... ..... *Epimelissodes* (*Brachymelissodes*) *cressonii* (Dalla Torre)
176(174). Clypeus yellow apico-medially, otherwise dark; T2 with white fasciae subapical and/or basal, but not apical; T6 laterally carinate, but carina not developed into a tooth or strong angle (except very rarely); antennae length only about half of body length.....*Xenoglossa* (*Peponapis*)
—. At least apical half (or more) of clypeus yellowish; T2 fasciae variable, but often strictly apical; T6 with a lateral tooth or projecting angle; antennae often longer than one-half body length.....177
177(176). Clypeal margin essentially touching eye margin, separated from eye margin only by an extremely thin inconspicuous carina; eyes enlarged, maximum width of eye in facial view equals distance between eyes or nearly so..... ..... *Epimelissodes in part*

—. Clypeal margin not quite touching eye margin, separated from eye by a narrow but measurable space; eyes not so enlarged, maximum width of eye in facial view notably less than distance between eyes 178

178(177). Gonostylus very narrow, apically bent, hooked, curved or angulate, apex not enlarged or thickened; pubescence entirely pale; mid to late summer bees.....*Xenoglossa*(*Xenoglossodes*)

—. Gonostylus straight, with apex thickened or enlarged (knob-like), never hooked or bent; pubescence variable but usually with considerable dark pubescence on abdomen (rarely orange); spring to early summer bees.....*Eucera* (*Synhalonia)*

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Appendix 1. Bee families, subfamilies, and genera included in the key, with the number of species known or potentially occurring in the Tallgrass Prairie/Greater Midwest region following the classification of Danforth *et al*. (2026). Taxa not known to occur within the focal regions are marked with an asterisk (*).

Taxon	# Species	Taxon	# Species
COLLETIDAE		*Heriades*	5
Diphaglossinae		*Hoplitis*	10
*Caupolicana**	1	*Osmia*	28
Colletinae		*Anthidiellum*	2
Colletes	32	*Anthidium*	8
Hylaeinae		*Dianthidium*	7
Hylaeus	20	*Paranthidium*	1
ANDRENIDAE		*Pseudoanthidium*	1
Andreninae		*Stelis*	9
Andrena	125	*Trachusa*	2
Panurginae		*Coelioxys*	21
Calliopsis	5	*Megachile*	41
*Macrotera**	2	APIDAE	
Panurginus	3	Anthophorinae	
Perdita	31	*Anthophora*	7
Protandrena	22	*Habropoda*	2
Oxaeinae		Apinae	
*Mesoxaea**	1	*Apis*	1
*Protoxaea**	1	*Bombus*	28
HALICTIDAE		*Centris**	2
Rophitinae		Eucerinae	
Dufourea	5	*Ancyloscelis**	1
*Sphecodosoma**	1	*Anthophorula*	3
Nomiinae		*Diadasia*	5
Dieunomia	5	*Epimelissodes*	11
Nomia	4	*Eucera*	9
Halictinae		*Exomalopsis*	1
Agapostemon	8	*Florilegus*	1
Halictus	7	*Melissodes*	32
Lasioglossum	104	*Melitoma*	2
Sphecodes	30	*Ptilothrix*	1
Augochloropsis	5	*Xenoglossa*	8

Augochlora	1
Augochlorella	4
Melittidae	
Dasypodainae	
Hesperapis	2
Melittinae	
Macropis	4
*Melitta**	3
Megachilidae	
Lithurginae	
Lithurgopsis	4
Lithurgus	1
Megachilinae	
Ashmeadiella	2
Chelostoma	3
Nomadinae	
Brachymelecta	2
Brachynomada	2
Epeoloides	1
Epeolus	15
*Ericrocis**	1
Holcopasites	8
Melecta	1
Neolarra	3
Nomada	65
Triepeolus	20
Xylocopinae	
Xylocopa	2
Ceratina	7



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