Key to the ***Megachile*** of the TGP region and greater midwest

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**Females**

1. Abdomen parallel-sided, i.e., T1-T4 (T5) all of equal width (in dorsal view); hind basitarsi relatively narrow and not much broadened medially, LxW of basitarsi usually around 4:1, but sometimes less

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Abdomen not parallel-sided, T1-T4 (T5) not of equal width, abdomen either broadest in basal portion then gradually narrowing posteriorally, ***or*** broadest medially (i.e., cordate to broadly or narrowly ovate); hind basitarsi usually somewhat broadened medially, its LxW often 3:1 or less……..…………....11

2(1). Head in lateral view with a large ventral tooth-like process (i.e., postero-lateral portion of gena with strong tooth-like process); hypostomal area smooth and shiny, flattened; throughout TGP region ……………………………………………………………………………………………………………………..………………..……….**pugnata**

Genae rounded or carinate, but without any tooth-like process ………………………………………………3

3(2). Clypeus with apical margin greatly expanded vertically as a broad, flattened area; mandible length at least 3x its basal width (at articulation)…………………………………………………………………………....4

Clypeus with apical margin variously modified but never expanded vertically into a broad flattened area; mandible not so long, never more than 2.5 times its basal width………………………….…5

4(3). Bee very large, 20mm or more in length; posterior margin of genae strongly carinate; mandible apically broadened, its length about 3x its basal width, with 4 teeth; wings heavily infuscated; thorax pubescence dense and uniformly tawny to yellowish-red, tegulae of the same color; introduced species, throughout TGP region but sporadic…………………………………………………………………………..**sculpturalis**

Bee smaller, 15mm or less; posterior margin of genae rounded, without a carina; mandible not at all broadened apically, very long and narrow, 4-5x its basal width, with 2-3 small teeth; wings very lightly infuscated; thorax pubescence thin and uniformly pale white, tegulae dark; central and southern TGP region…………………………………………………………………………………………………..………………..………**rugifrons**

5(3). Mandibles without any “cutting margins” between teeth, i.e., spaces between teeth (sinuses) entire, without any angles, processes, etc.; bees usually less than 15mm in length; 2nd hind tarsal segment usually relatively long, about 1/3 the length of hind basitarsis…………………………………………….6

Mandibles with a “cutting margin” between the two medial teeth, this cutting margin forming a small right angle, emanating from the inner margin of the 3rd tooth but not reaching the 2nd tooth; bees usually 15mm in length or more; 2nd hind tarsal segment shorter, no more than ¼ length of hind basitarsis…………………..…………………………………………………………………………………………………………………...9

6(5). Clypeal margin with one to several very small bead-like denticles…………………………………………7

Clypeal margin lacking any denticles or tiny teeth, although margin may be somewhat irregularly thickened……………………………………………………………………………………………………………………………..………….8

7(6). Clypeal apical margin with a single median denticle (sometimes weak), and several smaller denticles laterally; T6 pubescence all dark; central and southern TGP region……………….…………….**exilis**

Clypeal margin with two similarly-sized denticles medially, with one or two smaller denticles laterally; T6 pubescence usually largely pale, with intermixed darker hairs; throughout TGP region …………………………………………………………………………………………………..…………………………….……**campanulae**

8(6). S6 hairs dark, uniformly covering surface, not forming a distinct apical fringe, surface of S6 strongly and densely punctate; T6 covered with short more-or-less erect hairs; basal (4th) tooth of mandible well-defined, sinus between 3rd and 4th tooth deep, broadly U-shaped; southern half of TGP with a few records in the prairie peninsula…………………………………..………………………….………….**georgica**

S6 surface with scattered pale hairs and a distinct apical fringe, central portion of the sternite smooth and impunctate; T6 in profile without erect hairs except at extreme sides; basal tooth of mandible little more than a weak angle, sinus between it and the adjacent tooth tooth extremely shallow; throughout TGP region.……………………………………………………………………………**montivaga**, *in part*

9(5). Clypeus with long dark erect hairs, and pale, shorter, subappressed hairs beneath the dark hairs; clypeus flattened, the apical margin somewhat undulate but without any lateral processes or teeth; mandible usually with a very small process or ”point” between 3rd and 4th (basal) tooth; throughout TGP region…………………………………………………………………………………………………………………………………**frugalis**

Clypeus with erect pale hairs only, without any dark hairs; clypeal margin usually with a pair of lateral or sublateral processes or toothlike projections; mandible with sinus between 3rd and 4th tooth entire, without a small tooth or angle……………………………………………………………………………………………..10

10(9). Clypeal margin weakly trilobed, medial portion produced as a very broad weakly triangular lobe between two small lateral toothlike or lobelike processes; clypeus weakly convex; S5 hairs all pale; throughout TGP region………………………………………………………………………….….……………………….**inimica**

Clypeal margin laterally with a pair of toothlike or lobelike processes, but medial portion entire, not produced; clypeus flattened; S5 apical margin with black hairs, S5 hairs otherwise pale; central and southern TGP region………………………...…………………………………………………………………………..….**policaris**

11(1). Pubescence of head and thorax all or nearly all blackish…………………………………………..12

Pubescence of head and thorax predominantly pale, although usually with some amount of black or brownish pubescence………………………………………………………………………………………………….…..13

12(11). Tergal fasciae absent; scopa all blackish; wings very dark with violaceous reflections; mandible with five teeth; southern half of TGP region but apparently expanding northwards …………………………………………………………………………………………………………………………..……..**xylocopoides**

Tergal fasciae present (T2-T5), usually dusky-brown in color; scopa largely pale (at least on S2-S4); wings lightly infuscated, without violaceous reflections; mandible with four teeth; extreme southern TGP region………………………………………………………………………………………………**pruina,** *in part* (*dark forms)*

13(11). Mandible with three teeth; mouthparts extremely long, reaching to the end of the abdomen; Onagraceae specialists……………………………………………………………………………………………**oenotherae**

[**Note**: *amica*  Mitchell, a near-identical species but with much shorter (“normal”) mouthparts, may occur on the western margins of our area but has yet to be documented. The recently-described *chomskyi* Sheffield (Sheffield 2013) is nearly identical to *amica* but slightly larger, but appears to be restricted to Texas.]

Mandible with four or five teeth; mouthparts much shorter……………………………………………………14

14(13). S6 with a very narrow, smooth, shiny, hairless apical margin that is either abruptly reflexed upwards 70-90 degrees, or (rarely) thickened and truncate apically with a narrow sharp ridge along its dorsal surface; T6 surface very densely covered with extremely short pale scale-like hairs, entirely covering the integument and usually not recognizable as hairs except under high (60X) magnification; mandible with four teeth…………………………………………………………………………………………………………..15

S6 apical margin variable, occasionally very narrow, smooth and hairless, and very weakly reflexed, but never abruptly reflexed at a 70-90 degree angle, and never thickened and apically truncate; T6 surface variable, occasionally with dense short scale-like hairs; mandible with four or five teeth………………16

15(14). S6 with a very narrow, smooth, shiny, hairless apical margin that is abruptly reflexed upwards 70-90 degrees; scutum with anterior portion with long erect hairs only, without any appressed tomentum; T3-T5 with very short erect black hairs basal to the white fasciae; T2 usually with erect pale hairs; widespread in our region……………………………………………………………………………….……**parallela**

S6 thickened and truncate apically with a narrow sharp ridge along its dorsal surface; scutum anterior portion with considerable appressed tomentum and few long erect hairs; T3-T5 virtually hairless basal to the pale fasciae, if minute appressed hairs present they are all pale; T2 without any long erect hairs; not yet recorded from our region but may be on southern margins of the area…………….….**townsendiana**

16(14). Very large species, 18mm or so, pubescence of bee entirely pale (tawny, yellowish, to dull orange) except for very short dark hairs on T2-T5 basal to the apical fasciae; S6 bare apical margin very narrow, extending slightly beyond its apical hair fringe; forebasitarsis with long fringe of hairs on posterior margin; throughout TGP region………………………………………………………………………………..**fortis**

Smaller, 15mm or less; dark to blackish hairs present either on terga, scopa, head or scutum

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17(16). S6 apical half with its central area largely bare, hairs usually present laterally and apically …………………………………………………………………………………………………………………………….………………….18

S6 uniformly hairy in apical half, though hairs may be somewhat sparse…………………………22

18(17). T6 hairs all extremely short, shorter than hairs on T5, mostly appressed (extreme lateral margins may have some long hairs)……………………………………………………………………….…………..…………..19

T6 with long, erect to suberect hairs throughout most of disc, dense or sparse; short appressed hairs may be present or absent..……………………………………………………………………..……………20

19(18). Clypeal margin medially with a pointed denticle (mucro), bordered by 1-2 smaller denticles; mandibles with a cutting margin between 3rd and 4th tooth, visible in dorsal view; southern half of TGP region………………………………………………………………………………………………………………………………….**albitarsis**

Clypeal margin entire, usually with a narrow, smooth shiny edge, lacking any denticles or teeth; mandibles without any cutting margins visible in dorsal view; throughout TGP region..**montivaga,** *in part*

20(18). Mandible with 4 teeth; T6 and/or S6 with blackish hairs at least in part………………………….21

Mandible with 5 teeth, basal (5th) and 4th tooth small and close together compared to other teeth; T6 and S6 hairs usually all pale............................………………………**latimanus** and **perihirta**, *in part*

[Note: *latimanus* and *perihirta* females are extremely similar, the differences being largely a matter of pubescence, *perihirta* usually having more dark hairs on the vertex, the scutum, and on T2 and T6, than does *latimanus*. However, there is enough variation in pubescence in both species to make determinations of females unreliable (in areas of potential sympatry). *M. perihirta* is primarily western with few records in the TGP/Midwest region, while *latimanus* is common in the central and northern TGP and throughout the Midwest (based on males). Occurrences of *perihirta* in our region should be based on males.]

21(20). Narrowest space between upper margin of eye and posterior margin of vertex no greater than one ocellar diameter; genal margin weakly carinate; hind basitarsi hairs all pale; no cutting margin between 2nd and 3rd tooth, 3rd tooth truncate; widespread…………………………………………………….**petulans**

Narrowest space between upper margin of eye and posterior margin of vertex slightly more than one ocellar diameter; genal margin rounded; hind basitarsi hairs usually blackish, at least in part; cutting margin present between 2nd and 3rd tooth, 3rd tooth acute; extreme southern TGP

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22(17). Small bees, 10mm or less; sternites (S2-S5) with white apical fasciae; T2 and sometimes T3 dorsally with a pair of shallow foveae (these are oblong to round, somewhat fuzzy or velvety “patches” on the terga, roughly the size of the tegulae); introduced from the Old World, of sporadic occurrence throughout our region………………………………………………………………………………..….…………………….………..23

Larger bees (only rarely 10mm), sternites lacking apical fasciae; tergites lacking foveae……..25

23(22). Clypeal margin with a medial somewhat triangular-shaped projection; foveae present on T2 and T3…………………………………………………………………………………………………………………………………….. **apicalis**

Clypeal margin without a medial projection, either entire or weakly emarginate; foveae absent on T3, but present on T2……………………………………………………………………………………………………………………24

24(23). Foveae on T2 distinct; vertex long, slightly longer than two ocellar diameters; mid and hind basitarsi comparatively narrower than in *concinna* (below); T6 hairs all dark……………….….. **rotundata**

Foveae on T2 indistinct, superficial, sometimes hardly noticeable; vertex shorter, its length slightly less than two ocellar diameters; mid and hind basitarsi comparatively broader than in *rotundata*; T6 usually with a small amount of white pubescence basally, T6 hairs otherwise dark……..….**concinna**

**[Note**: what North American biologists have been calling *concinna* may actually be *pusilla* Perez according to Soltani et. al. (2017). While *concinna* is considered a valid species by those authors, it’s occurrence in the New World may be restricted to the Antilles; it’s establishment in the US is uncertain (Soltani et. al. (2017).]

25(22). Tergites lacking pale fasciae, even on lateral margins; mandible with four teeth…………………26

At least some tergites with pale fasciae, usually complete but occasionally only on the lateral

margins; mandible with four or five teeth………………..…………………………………………………………………….28

26(25). Clypeus weakly convex; forebasitarsi posterior margin hairs all shorter than length of forebasitarsi; hind basitarsi length x width 3:1; cutting margin between 3rd and 4th tooth incomplete; north and central TGP…………………………………………………………………………………………..………………….**gemula**

Clypeus flattened throughout; forebasitarsi posterior margin hairs all as long, or slightly longer than length of forebasitarsi; hind basitarsi length x width 2-2.5:1; cutting margin between 3rd and 4th tooth complete……………..……………………………….………………………………………………………………………………27

27(26). Hairs on scutum all pale yellow; T2 largely pale but with black hairs on posterior margin; scopal hairs all black; Prairie peninsula…………………………………………………………………………….………………..**mucida**

Scutum with dark hairs at least medially; T2 entirely pale yellow, without black on posterior margin; scopal hairs usually fulvous/reddish at least in part; nTGP…….……………….……….**melanophaea**

28(25). T6 pubescence extremely short and appressed, the hairs much shorter than T5 discal pubescence………………………………………………………………………………………………………………………………..29

T6 pubescence comprised of long hairs at least in central part of tergite, these hairs similar in length to hairs on T5; hairs may be erect, sub-erect or decumbent, dense or scattered, dark or pale…32

29(28). Cheeks very broad, 1.5 times as broad as eye width (in lateral view); clypeal margin irregularly dentate, with two small lateral lobate processes and a medial process that is somewhat bidentate; mandible with 5 teeth; S6 hairs all pale; large bee, length 15mm or more; nTGP…….…………**inermis**

**C**heeks narrower, no wider than eye width (in lateral view); clypeal margin either entire or with a small median denticle; mandible with 4 teeth; S6 hairs dark; size variable…………………………………..30

30(29). Clypeal margin entire; bee length no greater than 15mm………………………………………………….31

Clypeal margin with a small median denticle; bee length 15mm or more; sTGP..**deflexa,** *in part*

31(30). Lateral ocelli much closer to eyes than to posterior margin of vertex; apical margins of T3-T5 strongly depressed, central portions of T3-T5 strongly convex; nTGP, cTGP, PP….…..…….**dakotensis**

Lateral ocelli subequally distant from eyes and posterior margin of vertex; apical margins of T3-T5 depressed only laterally, hardly so medially, and central portions of T3-T5 flat, not convex; widespread……………………………………………..………………………………………………………………..**…….mendica**

[Note: *M. gentilis* Cr. will come to this couplet; it occurs in AR, LA, OK, TX. S6 hairs are all black, and T6 weakly concave, not as flat in profile as *mendica*.]

32(28). T6 in profile concave (or the apical half depressed compared to the basal portion)………………33

T6 in profile straight (or flat)……………………………………………………………………………………………..36

33(32). T3-T5 apical margins depressed, pre-apically narrowly convex (from side to side); S6 hairs all dark

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T3-T5 apical margins and pre-apical areas uniformly flat or nearly so; S6 hairs variable, pale to dark……………………………………………………….…………………………………………………………………………………….35

34(33). Mandible maximum length about 2/3 length of the eye; hind basitarsus nearly parallel-sided; clypeus apical margin irregularly denticulate; widespread but absent from sTGP………………. **addenda**

Mandible maximum length about 1/2 length of the eye; hind basitarsi with anterior margin convex compared to posterior margin, which is straight; clypeus apical margin entire; widespread ……………………………………………………………………………..………………………………………………………..….. **texana**

[Note: Formerly considered a subspecies of *M. texana, M. lippiae* has recently been recognized as distinct from *M. texana* by Sheffield et. al. (2011) and Bzdyk (2012). The females of *M. lippiae* have black hairs only on T5 and T6 (in dorsal view), compared to *M. texana,* which has black hairs on most tergites, not just T5/T6. *M. lippiae* is primarily western, but there are records from the eastern US and the Midwest; these need to be confirmed as there is some variation in tergal pubescence among Midwestern *texana* specimens.]

35(33). T6 and S6 hairs, including apical fringe of S6, all pale yellowish to orangeish; apical span of mandible 1.5 times width of mandible at base; mandible with five teeth but easy to misinterpret as four teeth………………………………………………………………………………….………….**latimanus** and **perihirta**, *in part*

[Note: *latimanus* and *perihirta* females are extremely similar, the differences being largely a matter of pubescence, *perihirta* usually having more dark hairs on the vertex, the scutum, and on T2 and T6, than does *latimanus*. However, there is enough variation in pubescence in both species to make determinations of females unreliable (in areas of potential sympatry). *M. perihirta* is primarily western with few records in the TGP/Midwest region, while *latimanus* is common in the central and northern TGP and throughout the Midwest (based on males). Occurrences of *perihirta* in our region should be based on males.]

T6 and S6 with at least some dark hairs, S6 narrow apical fringe always dark; apical span of mandible about equal to basal width of mandible; mandible with four teeth; widespread..…….**brevis**

[**Note**: *M. pseudobrevis* is a recently-recognized species, formerly considered a sub-species or synonym of *brevis,* see Sheffield et. al. (2011) and Byzdk (2012). Distinguishing features are the dominance of black hairs on the tergites (other than the white fasciae) in *pseudobrevis*, true *brevis* having all or nearly all pale hairs on the tergites. *M. pseudobrevis* is considered a southeastern species, but *brevis* specimens with all or nearly all black hairs on the tergites occur in the Midwest, as well as intermediates.]

36(32). Large bee, 15mm in length or more; lateral ocelli much closer to eyes than to posterior margin of vertex; clypeal margin with a single median denticle; sTGP……………………………………**deflexa,** *in part*

Bees no larger than 15 mm; lateral ocelli subequally distant from eyes and posterior margin of vertex; ***if*** with a single median denticle ***then*** most of clypeal margin denticulate…………………………….37

37(36). Mandible with four teeth; cheeks broader than eye width in lateral view…………………..………38

Mandible with five teeth; cheeks in lateral view no greater than eye width………………………..40

38(36). Clypeal margin denticulate, usually with a slightly more pronounced though still small median denticle; hind basitarsi broad, width nearly half the length; sand obligate, throughout most of region but apparently absent from nTGP…………………………………………………….………….……………………..……**integra**

Clypeal margin entire or with a small median notch; hind basitarsi not as broad………………….39

39(38). S6 hairs mixed, dark and pale; tergal fasciae restricted to lateral margins on T2-T3, fasciae complete on T4 and T5, though T4 fasciae sometimes interrupted medially; nTGP..……………..**frigida**

S6 hairs all dark; fasciae complete on T2-T5; PP, cTGP.…………………………………………….**ingenua**

40(37). S5 and S6 scopal hairs all black; mandible with complete cutting margins between each of the three basal teeth (teeth 3, 4 and 5); central and southern portions of TGP, rare………………..**comata**

S5 and S6 scopal hairs pale; mandible without any cutting margins between each of the three basal teeth; northern species……………………………………………………………………………………………………………………41

41(40). T6 hairs all dark; apex of the antennal cleaner apically acuminate; nTGP, cTGP, PP

………………………………………………………………………………………………………………………………. **centuncularis**

T6 with some dark hairs but predominantly with orangeish-golden hairs; apex of the antennal cleaner apically mucronate; nTGP, cTGP, PP……………………………………………………………………………**relativa**

**References:** Sheffield (2013); Bzdyk (2012); Sheffield et. al. (2011); Gonzalez and Griswold (2007); Mitchell (1962)

End 2/11/24