

Key to **Osmia** females known from eastern North America (east of the Great Plains)

\*= species known from tallgrass prairies

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[Note: *Os. paradistica* Sandhouse, a northwestern North American species, has been recorded recently from south-central Quebec, Canada (near Lac Saint Jean, lat. 48 degrees), but is not included in the key below; the female has not been formally described as far as I know but there are photos of the female on the web; it looks almost identical to *Os. tarsata* (see couplet 30.)]

1. Integument brilliant metallic green with purple to blueish tints, Chrysidid-like; scopa blackish, other hairs on body pale; most hairs of galea (@ 40x) hamate; rare species from midwestern prairies and Ozark glades, one recent eastern record.....**illinoensis** Robertson\*  
*Note: O. ribifloris* Cockerell, a species of the west and southwest US, superficially resembles **illinoensis** in the brilliant green to blue or purplish integument, but can be separated from **O. illinoensis** by the overall blackish pubescence, the longer malar space which has an elongate depression, and the mandibles (sinus between basal and medial teeth entire and cutting surface complete in **ribifloris**, concave and incomplete in **illinoensis**).  
**O. ribifloris** has recently been used experimentally in the southeast and northeast US (and possibly elsewhere) for blueberry pollination.  
Integument metallic green to blue but never brilliantly so, occasionally black (with or without metallic sheen); other characters variable.....2
- 2(1). Clypeal margin medially with a deep, semicircular to quadrate emargination **and** malar space with a lobate process or projection; integument blue, scopa dark; widespread in ENA except far north.....**lignaria** Say\* .  
Clypeal margin medially without a deep, semicircular to quadrate emargination (though other clypeal modifications may be present) **and** malar space without a lobate process or projection.....3
- 3(2). Apico-**lateral** margins of clypeus each with a stout horn-like projection; medium to large bees with pale scopae and dull, very weakly metallic green integument; introduced Old World species .....4  
Apico-**lateral** margins of clypeus without stout projections, although apico-**medial** margin of clypeus may be modified with projections; (**if** apico-lateral margins strongly angulate **then** scopa blackish, not pale); scopa color variable, often black; integument often blueish .....5
- 4(3). Basal tooth of mandible rounded, medial tooth of mandible acute; clypeus almost entirely smooth, shiny and impunctate (except at extreme base), contrasting with punctate surface of supraclypeal area..... **taurus** Smith  
Basal tooth of mandible acute, resembling medial tooth of mandible; clypeus with basal half finely, densely punctate, similar to supraclypeal area.....**cornifrons** (Radoszkowski)
- 5(3). Clypeal margin medially with one to several large, stout teeth or projections; medium to large bluish bees with blackish scopae; oligoleges of Asteraceae; ENA south of coniferous/  
boreal forest region.....6  
Clypeal margin medially lacking large, stout teeth or projections, but may be emarginate, incised, concave, sharply carinate, or enlarged (swollen).....7

- 6(5). Clypeus apico-medially with two or three stout teeth; color dark blue; general Asteraceae oligolege; widespread but sporadic in eastern US south of boreal/coniferous forest region..... **texana** Cresson\*  
 Clypeus apico-medially with a single somewhat spatulate process, this process emarginate medially, angulate laterally; color usually bright blue; primary oligolege of *Cirsium* spp.; southeastern US into the lower midwest.....**chalybea** Smith\*
- 7(5). Mandible extremely modified, with a strong triangular process projecting dorsally from basal margin of mandible; apical half of clypeus smooth and impunctate with a strong medial carina (not visible when mandibles are closed); scopa pale; oligolege of vernal Asteraceae; throughout much of ENA south of boreal/coniferous forest region  
 .....**georgica** Cresson\*  
 Mandible without any projection along dorsal margin; clypeus without a medial carina, and clypeus punctate throughout except for the usually narrow impunctate apical margin.....8
- 8(7). Clypeus with apical margin (above clypeal hair tufts) enlarged, thickened, and rounded, smooth and shiny; large to very large species.....9  
 Clypeus with apical margin (above clypeal hair tufts) bevelled and sharp-edged, not enlarged or rounded; size variable.....10
- 9(8). Hind basitarsus parallel-sided; scutum shiny between punctures; found throughout ENA south into Ozarks, Appalachians.....**bucephala** Cresson\*  
 Hind basitarsus broadened medially, narrowed basally, not parallel-sided, scutum dull between the dense, fine punctures; not occurring south of boreal/coniferous forest region  
 ..... **nigriventris** (Zetterstedt)
- 10(8). Ventral margin of mandible angulate or toothed medially, best viewed from beneath (can be difficult to recognize if mandibles are closed); mandibular carinae parallel  
 (*inermis*, *inspergens*, *subaustralis*).....11  
Ventral margin of mandible without a pronounced angle or tooth anywhere along its length,  
 mandibular carinae variable (either parallel or converging onto apical tooth) .....13
- 11(10). Integument black, with few or no metallic tints; scopa blackish; anterior face of T1 tessellate; not occurring south of boreal/coniferous forest region...**inermis** (Zetterstedt)  
 Integument metallic blue or greenish, anterior face of T1 variable.....12
- 12(11). Mandible with medial tooth about equidistant between basal and apical teeth, slightly

closer to apical tooth; sinus between basal and medial teeth concave; scopa pale; anterior face of T1 shiny, mostly unsculptured; clypeus apically with a thick “brush” of brownish hairs unlike hairs elsewhere on face; ENA south to Ozarks, Appalachians

.....**inspergens** Lovell and Cockerell\*

Mandible with medial tooth much closer to apical tooth than to basal tooth; sinus between basal and medial teeth not concave but straight, usually with a raised cutting edge; scopa blackish; anterior face of T1 tessellate; clypeus apically produced and broadly emarginate;

oligolege of Asteraceae; apparently restricted (in ENA) to the Upper Great Lakes Region

.....**subaustralis** Cockerell

13(10). Scopal hairs on ST2 - ST4 light-colored (pale white to light brown) .....14

(*conjuncta*, *subfasciata*, *distincta*, *cordata*, *sandhouseae*, *pumila*, *albiventris*, *inurbana* in part, *unknown Lost Mound sp.*, in part)

Scopal hairs on ST2 - ST4 much darker, brown to black.....23

(*laticeps*, *aquilonaria*, *coerulescens*, *cyaneonitens*, *tarsata*, *simillima*, *felti*, *tersula*, *proxima*, *collinsiae*, *virga*, *atriventris*, *inurbana* in part, *unknown Lost Mound sp.*, in part, *subarctica*)

14(13). Hind coxa with strong longitudinal carina along inner ventral angle, often difficult to see; narrow sulcus present between apical lamella (i.e., the “shelf”) of T6 and body of T6, usually hidden by pubescence; apical fasciae usually conspicuous, in part, and tergites closely,

strongly punctate all the way to apical margins; ENA south of boreal/coniferous forest region .....15

Hind coxa rounded, not carinate; no sulcus present between T6 lamella and body of tergite; tergal fasciae sometimes present but usually weak, punctures variable.....16

15(14). A pair of small tubercles (these slightly smaller than the ocelli) lying between and just above the antennal sockets; anterior face of T1 tessellate, provided with long pale hairs; widespread in ENA south of boreal/coniferous forest.....**conjuncta** (Cresson)\*

No tubercles present between and just above antennal sockets, though tiny bumps can occasionally be distinguished; anterior face of T1 shiny, with short pale hairs; southern tier of US states north to NJ and St. Louis.....**subfasciata** Cresson\*

*Note: Os. conjunctoides Robertson, formerly considered a synonym or subspecies of subfasciata, has recently been recognized as a separate species (Rightmyer et. al. 2011); it is presumed to be a rare Florida endemic, separated from typical subfasciata by the very short stiff hairs on the face.*

16(14). Mandibular carinae converging apically, diverging basally, mandibles essentially quadrate; tergites densely punctate throughout, lacking any impunctate margins; SE US

.....**sandhouseae** Mitchell

Mandibular carinae parallel; mandible broadened apically, constricted to some degree between base and apex; terga usually (but not always) with impunctate margins.....17

17(16). Clypeal margin very broadly, shallowly concave, hairs on ocellar area

- usually long and proclinate; ocellar area usually “stained” purplish-black; primary oligolege of *Penstemon*, occasionally found on Fabaceae; ENA south of boreal/coniferous forest region.....**distincta** Cresson\*  
 Clypeal margin entire or with a small, triangular notch medially, never broadly concave; hairs on clypeus and face erect, not proclinate.....18
- 18(17). Clypeal margin with a small triangular notch apico-medially; hypostomal carina with a small sharp tooth at or just before the hypostomal angle; Great Lakes region and north...19  
 Clypeal margin entire; hypostomal carina without a small sharp tooth at or before the hypostomal angle; widely distributed.....20
- 19(18). Sinus between basal and medial teeth of mandible broadly V-shaped, about 2x as wide as deep (width measured from tip of basal tooth to tip of medial tooth); sinus between median and apical tooth usually perfectly V-shaped  
 .....**inurbana** (pale forms); *formerly called sp. B\*, michiganensis, and trevoris*  
 Sinus between basal and medial teeth of mandible not so broadly V-shaped, instead more perfectly V-shaped, about as deep as it is wide  
 .....**unknown species from Lost Mound NWR Illinois**
- 20(18). Scutal punctures contiguous or nearly so, interspaces very narrow to absent.....21  
 Scutal punctures more separated, interspaces (at least in central area of scutum) as wide or wider than puncture diameter.....22
- 21(20). Punctures of scutum distinct and well-defined, even though very close together; marginal hairs of galea as long as apical joint of maxillary palp; fringe hairs of forebasitarsi short, at most half the length of the segment; forebasitarsi length x width about 3:1; apex of malus rounded or blunt, not acute or spine-like; T1 pubescence thin, pale, similar to that on T2-T5; central and southern US.....**cordata** Robertson\*  
 Punctures of scutum very crowded, over much of scutum so close together as to appear irregular and indistinct, creating a roughened, rather than punctate surface; marginal hairs of galea short, much shorter than apical joint of maxillary palp; fringe hairs of forebasitarsi long, some almost as long as forebasitarsi; forebasitarsi longer, length x width almost 4:1; apex of malus produced, acute; surface of T1 laterally with considerable erect white pubescence, very unlike pubescence of remaining terga; apparently confined to remnant habitats in Highlands Co., FL..... **calaminthae** Rightmyer, Ascher and Griswold
- 22(20). Medial portion of metanotum horizontally-oriented, almost on same plane as scutum and scutellum, and visible in dorsal view; punctures on upper anterior portion of pleura separated by about one puncture diameter, punctures becoming much more dense, almost confluent, on mid- to lower portions of pleura; hypostomal carina of uniform height

- throughout; throughout ENA south of boreal/coniferous forest region....**pumila** Cresson\*  
 Medial portion of metanotum vertically-oriented, mostly perpendicular to plane of scutum and scutellum, hardly visible in dorsal view; pleural punctures mostly of similar spacing throughout pleura; hypostomal carina often produced at angle of hypostome; found in boreal/coniferous forest region south into coniferous/deciduous transition zone  
 .....**albiventris** Cresson
- 23(13). Mandibular carinae converging apically, diverging basally; mandible nearly quadrate (includes *atriventris*, *felti*, *laticeps*, *virga*).....24  
 Mandibular carinae parallel; mandible variable, but often broadened apically, and constricted to some degree between base and apex (includes *coerulescens*, *collinsiae*, *cyaneonitens*, *tarsata*, *inurbana* in part, *unknown Lost Mound sp.*, in part, *subarctica*, *proxima*, *simillima*, *aquilonaria*, *tersula* .....27
- 24(23). Integument black, dull, non-metallic; pubescence of thorax white; probable oligolege of Ericaceae; small black species not found south of boreal/coniferous forest region  
 .....**laticeps** Thomson  
 Integument dull metallic greenish or blueish.....25
- 25(24). Lower portion of gena and postgena with long, dark, strongly curled hairs; malus terminating in a long, stout spine; robust, dark blue species, uncommon to rare; northern region, distribution somewhat unclear.....**felti** Cockerell  
 Hairs of gena and postgena mostly straight, if some slightly curled these are always pale; malar spine small; smaller, less robust forms.....26
- 26(25). Forebasitarsi long and narrow, LxW about 5:1, its apex ventrally with a single row of dark spine-like setae, these noticeably larger, stouter and more curved than adjacent setae, these modified setae also present on the following two foretarsal segments; clypeus with punctures small, dense, interspaces somewhat dull; oligolege of Ericaceae; boreal/coniferous forest region, south to coniferous/deciduous transition zone along southern Great Lakes.....**virga** Sandhouse  
 Forebasitarsi shorter, LxW about 4:1; setae at base of forebasitarsus (and following segments) not differentiated, not conspicuously enlarged or darkened, not spine-like; clypeal punctures coarser, interspaces shiny; polylege; throughout ENA except far south, likely a complex of several (3?) species .....**atriventris** Cresson\*
- 27(23). Integument black, non-metallic; pubescence dark brown throughout except white on vertex, scutum, scutellum, and T1 dorsally; boreal/coniferous forest region  
 .....**aquilonaria** Rightmyer, Griswold and Arduser  
 Integument largely dull metallic green to blue.....28
- 28(27). Clypeal margin with two pair of hair tufts; space between basal and medial teeth horizontal, not concave; propodeal triangle predominantly shiny, lacking extensive sculpture or tessellation; apical fasciae present on tergites, usually complete on T4-T5; introduced species, present day distribution unclear.....**caerulescens** (Linnaeus)  
 Clypeal margin with one pair of hair tufts; space between basal and medial teeth concave to

some degree; propodeal triangle largely dull, tessellate, or otherwise sculptured, any shiny areas are peripheral and not extensive.....29

29(28). Forebasitarsus short, broad (LxW about 3:1) and somewhat flattened, abundantly provided with light-colored/light-brown curly hairs; pubescence of thorax mostly pale; boreal/coniferous forest region south into deciduous/coniferous transition and northern and central prairie regions.....**simillima** Smith\*

Forebasitarsus longer, narrower, not flattened, and hairs not curly; pubescence of thorax variable, often dark brown or blackish on pleura.....30

30(29). Mid-basitarsus short and broad (LxW about 2.5:1 or less); T2-T5 with abundant, long black or dark brown hairs plainly visible in dorsal view; hind femur with a small, narrow, ventrally-directed process at articulation with tibia; boreal/coniferous forest region, probably a sand-obligate.....**tarsata** Prov.

(formerly referred to as *O. kenoyeri* Cockerell, Cory Sheffield worked out the synonymy).

Mid-basitarsus longer, LxW at least 3:1, and usually 4:1; pubescence of T2-T5 variable, but if dark brown or black then quite short, never long and hardly visible in dorsal view...31

31(30). Mandible essentially quadrate, not broadened apically and hardly constricted between base and apex; apical tooth not much larger or longer than medial tooth; metanotum usually with distinct punctures.....32

Mandible distinctly broadened apically and somewhat constricted between base and apex; apical tooth usually larger and longer than other teeth; metanotum often tessellate, with few if any punctures.....33

32(31). Apical rims of T1-T3 sharply defined, narrow, shining; galea hairs short, pale; central and southern US south of boreal/coniferous forest region..... **collinsiae** Robertson\*

T1-T3 with apical rims broader, not sharply defined; galea hairs longer, brown; boreal/coniferous forest region south into deciduous/coniferous transition

.....**proxima** Cresson\*

33(31). Ocellar area with stiff proclinate hairs which meet similar hairs directed upwards from the supraclypeal area and base of clypeus; mandible very broad apically and hypostomal carina very pronounced; presumed *Penstemon* oligolege; western species known in our region only from MN.....**cyaneonitens** Ckll.

Ocellar area and supraclypeal area with normal hairs, hairs not proclinate; mandible nor so broad apically and hypostomal carina less produced at angle; northern species, not occurring south of the Great Lakes region except along Appalachians.....34

34(33). Clypeal margin with a small notch apico-medially; hypostomal carina with a small sharp tooth at or just before the hypostomal angle; Great Lakes region and north.....35

Clypeal margin entire; hypostomal carina without a small sharp tooth at or before the hypostomal angle; northern, south along Appalachian Mtns.....36

35(34). Sinus between basal and medial teeth of mandible broadly V-shaped, about 2x as wide as deep (width measured from tip of basal tooth to tip of medial tooth); sinus between

median and apical tooth usually perfectly V-shaped; pubescence of head, terga, and pleura (in part), largely dark brown  
.....**inurbana** (pale forms); *formerly sp. B\*, michiganensis, and trevoris*  
Sinus between basal and medial teeth of mandible not so broadly V-shaped, instead more perfectly V-shaped, about as deep as it is wide; pubescence entirely pale, light brown at most, occasionally slightly darker on S5 and S6  
.....**unknown species from Lost Mound NWR Illinois**

36(34). Clypeal punctures dense (nearly contiguous), and relatively coarse; boreal/coniferous forest region.....**tersula** Cockerell.  
Clypeal punctures finer, slightly separated; very similar to *tersula* (above); boreal/coniferous forest region.....**subarctica** Cockerell  
(*I formerly referred to this species as "sp. C" (i.e., michiganensis Mitchell) in earlier keys; Molly Rightmyer worked out the synonymy.*)

end 7/8/2020