***Osmia*** males known from eastern North America

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**1.** T6 lateral margin with obtuse lobe or acute angle, and T6 without an apico-medial emargination; tergites closely punctate throughout, lacking impuncate apical margins………………………..………….2

T6 without lateral lobes or angles, but often with a small apico--medial emargination; tergites usually with impunctate apical areas, but these are variable, from extremely narrow to broadly impunctate, and sometimes ill-defined…………………………………………………………………….………………………………………………..3

**2(1).** T6 lateral margin with acute angle……………………………………..……………………..…….***conjuncta***

T6 lateral margin with obtuse lobe……………………………………………..………………………………..***subfasciata***

[Note: *Osmia conjunctoides* is a former synonym of *subfasciata* now considered a separate species (see female key). The males of *conjunctoides* are very similar to *subfasciata* males; the two are sympatric in the southeast US and not easily separated. The propodeal triangle is usually dull on the lower half in *conjunctoides*, shiny in *subfasciata*.]

**3(1).** T7 entire, without a median emargination or notch; usually (not always) some amount of black hairs present on tergites or head……………………………………………………………………………………………….….4

T7 apical margin with a median emargination or notch, usually V-shaped or U-shaped, sometimes small; hairs on tergites and head all pale…………………………………………………………………………………….…….…..7

**4(3).** T3-T5 pubescence entirely black……………………………………………………………………………………………5

T3-T5 pubescence all or nearly all pale or light-colored; introduced species rapidly spreading throughout the region………………………………………………………………………….....................…………………………………………..6

**5(4).**  Mid-tarsal segments greatly enlarged compared to tarsal segments on other legs; inner hind tibial spur about twice the size of outer hind tibial spur; S2 medio-apically with a small thickened process which appears like a small tuft of black hair; usually large, 12mm or greater............................***bucephala***

Mid-tarsal segments on all legs similar; hind tibial spurs approximately similar in size; S2 unmodified, without a small thickened process or black hair tuft on apical margin; smaller species, usually slightly less than 12mm…..…………………………………………………………………………………………………………………….…***lignaria***

**6(4).** Gonoforceps gradually broadened to the enlarged sub-truncate apex, which has a very short lateral process angled towards the penis valves………………..………………………………………..….…***cornifrons***

Gonoforceps narrow throughout, including the apex, largely parallel with the penis valves…..…***taurus***

**7(3**). Integument all dark, without blue or green overtones or reflections; northern/boreal species ……………………………………………………………………………………………………………………**……………………………………8**

Integument largely blue or green, bright to dull, integument never lacking blue or green tones………12

**8(7).** T5 and T6 with apico-lateral angles strongly reflexed laterally; Great Lakes region, New England, and eastern Canada…………………………………………………………………………..…………………………… ***nigriventris***

T5 and T6 with apico-lateral angles not or only weakly reflexed laterally……………………………………….9

**9(8).** Gonoforceps pre-apically much broadened, at least twice as broad as narrowest width of gonoforceps; eastern Canada, only one US record (northeastern MN)……….…..……………….***nearctica***

Gonoforceps pre-apically only slightly broadened if at all, and not much broader than narrowest width of gonoforceps………………………………………………………………………………………………………………………………10

**10(9).** S4 with hamate bristles on apical margin and on preapical area; eastern Canada, no US records ………………………………………………………………………………………………………………………………….***aquilonaria***

S4 without hamate bristles on apical margin and on preapical area, the bristles occurring there all simple…………………………………………………………..………………………………………………………………………….11

**11(10).** S4 apical margin truncate, medially emarginated with rounded lobes bordering the emargination; Great Lakes region, New England, eastern Canada….………………………………….***inermis***

S4 margin essentially evenly convex, without a medial emargination bordered by distinct lobes; Great Lakes region, New England, eastern Canada…………………………………………**………………………….*laticeps***

**12(7).** Brilliant green with purple-blue overtones, sometimes largely purple-blue; rare species of prairies, glades and open areas…………………………………………………………………………………………***illinoensis***

Blue or dull green, but never as above…………………………………………………………………………………………………13

**13(12).** T3-T5 hairs all or mostly dark brown to black; northern species………………………………………….14

T3-T5 hairs all pale/white; widespread species, in part..…………………………………………………………………..16

**14(13**). Hind basitarsi broadened in distal half, abruptly narrowed in basal half; mid-basitarsi enlarged, swollen, assymateric in outline; S2 apico-medially tuberculate…………………………………………….. ***tarsata***

Hind and mid-basitarsi unmodified, parallel-sided; S2 without a tubercle apico-medially……………..15

**15(14)** S4 apical margin with median 1/3 or so produced and truncate or sub-truncate…***subaustralis***

S4 apical margin broadly convex, entire, median third not produced; in our region known only from MN

……………………………………………………………………………………………………………………………………….c***yaneonitens***

**16(13).** Mid-tarsal segments 2 and 3 modified, compressed, different in appearance from foretarsi…17

Mid-tarsal segments 2 and 3 similar to foretarsi, not modified or compressed…………………………………18

**17(16).** Hind tibial spurs with tips curved; T6 without an apico-medial emargination, and T6 without any apico-medial emargination……………………………………………………………………………………………...…………..***felti***

Hind tibial spurs straight and not curved apically; T6 and T7 with strong apico-medial emargination; eastern Canada, no eastern US records............................................**…………………………………..*paradisica***

**18(16).** Hind basitarsi with stalk-like basal portion, broadened distally (width of distal portion at least 2X width of basal portion) *AND* hind basitarsi without a tooth or callus on inner margin medially or sub-medially; F2-F9(10)convex in outline (crenulateor moniliform); gonoforceps distally extremely narrow, almost needle-like………………………………………………………………………….…………………………………..***simillima***

Hind basitarsi essentially parallel-sided*, OR* hind basitarsi inner margin with a small tooth or callus medially or sub-medially; flagellar segments isodiametric; gonoforceps distally only slightly narrowed, not needle-like……………………………………..……………………………………………………………………………….……19

**19(18).** S4 apical edge very narrowly grooved, the narrow groove shiny, margined above and below by minute carinae; S2 centrally with erect hairs, hairs not appressed…………………………………………………..20

S4 apical edge simple, lacking a narrow groove; S2 centrally usually with appressed hairs, hairs often very short…………………………………………………………………………………………………………………..……………..……23

**20(19)**. Lateral ocelli closer to eye margin than to edge of vertex; usually 12mm or greater in length; ……………….…………………………………………………………………………………………………………………………………..21

Lateral ocelli closer to edge of vertex than to eye margin, or equidistant; usually less than 12mm …………………………………………………………………………………………………………….……………………………………….22

**21(20)**. Large species (12mm or greater), deep blue in color, with dark brown wing membranes; S4 apico-medial bristles dark brown to blackish; gonoforceps with very narrow pre-apical setal tuft on inner margin…………………………………………………………………………………………………..…………………………………***chalybea***

Usually slightly smaller species (10-11mm), usually dark blue to blackish-blue in color, wing membranes lighter brown; S4 apico-medial bristles pale; gonoforceps without pre-apical setal tuft on inner margin ………………………………………………………………………………………………………………………………………..……***texana***

**22(20).** Propodeal triangle brilliantly shining, mirror-like; gonoforceps extremely narrow throughout, slightly hooked apically, without a preapical notch; introduced species…………………….……***caerulescens***

Propodeal triangle dull; gonoforceps gradually attenuated towards apex, not hooked, and with a pre-apical notch…………………………………….…………………………………………………………………………………***georgica***

**23 (19).**  S4 shallowly emarginate on apical margin medially, forming two broad lobes on either side of the emargination…………………………………………………….……………………………………………………..***inspergens***

S4 entire, apical margin usually weakly to strongly convex, without emargination or lateral lobes..…24

**24(23).** S4 apico-medially with a narrow hairless zone…………………………………………………………25

S4 apico-medially with numerous hairs or bristles throughout, these not separated by a narrow hairless zone……………………….…………………………………………………………………….….…………………………………………..27

**25(24).** S2 with all hairs erect, relatively long; hind basitarsi with conspicuous tooth on inner margin medially; T2 with impunctate apical margin long, about 1/3 the length of the tergite……………...….***tersula***

S2 with at least hairs on basal portion all appressed; hind basitarsi with or without tooth or callus on inner margin, *IF* present then located sub-medially; T2 impunctate apical margin much shorter.………25

**26(25).** T7 emargination with a pair of acute teeth on either side of emargination; S2 hairs all appressed or subappressed, denser on apical margin forming a broad white fascia at certain viewing angles; S4 hairs apico-medially dark………………………………………………………………………..……….…***collinsiae***

T7 emargination very reduced, hardly present, lacking acute teeth on either side; S2 hairs on apical 1/3 or so long and erect, short and appressed on basal portion; S4 hairs apico-medially pale…***albiventris***

**27(24).** S3 emargination hairs extending as a small central “peaked tuft” slightly beyond the apical margin of S3, not entirely contained within the emargination; S3 lateral hairs very short, and S2 hairs also very short, in lateral view not exceeding apical margin of S2; S3 apical margin convex; hind basitarsis without tooth or callus or if present extremely reduced and hardly noticeable; common species in the EUS……………………………………………………………………………………………………………………………..**.....*atriventris***

S3 emargination hairs not extending as a small central “peaked tuft” slightly beyond the apical margin of S3, but largely confined within the emargination; S2 and S3 lateral hairs variable but often long; S3 apical margin variable; hind basitarsis often with distinct tooth medially……………………………………………………28

**28(27).**  S3 emargination very broad and very shallow, extending across nearly the entire apical margin of S3, with a small median hair tuft; T7 emargination V-shaped and deep…………………..…***distincta***

S3 emargination variable but usually more-or-less V-shaped, about 1/3 the apical width of S3, and usually completely filled with marginal hairs……………………………………………………………………………..**29**

**29(28).** S3 medial emargination weak, not strongly V-shaped, and S2 and S3 with long hairs on apical margins; T4-T5 with weak apical fascia but this often worn……………………..…………………………….***pumila***

S3 medial emargination well-defined, more-or-less V-shaped, S3 hairs on apical margin usually no longer than the depth of the emargination; tergal fascia absent…………………………………………………………………**30**

**30(29).** Gonoforceps with apical tips reflexed upwards at about a 90 degree angle (in lateral view); hind tibia inner margin lacking tooth or callus; northern species………………………………………………….....**31**

Gonoforceps with apical tips straight or very weakly curved upwards; hind tibia frequently with small tooth or callus on inner margin medially or sub-medially……………….……………………………………………..**32**

**31(30). From Mitchell: “**S3 with a broad, rounded median emargination which is filled with a row of rather short setae which do not markedly converge medially”

……………………………………………………..……………..…***subarctica*** Cockerell (i.e., *michiganensis* Mitchell)

S3 emargination V-shaped……………………..…………………………………………………………………………31a

**31a(30).** S3 hairs on lateral marginsnot much longer than hairs within the median emargination; S4 hairs apico-medially straight……………………………………………………………………………………***nr. trevoris***

S3 hairs on lateral marginsmuch longer than hairs within the median emargination; S4 hairs apico-medially hamate or wavy……………………………………..…………………………………………..……***nr. inurbana***

**32(30).** T7 emargination bordered by a pair of acute projections; S3 apical margin convex in outline ……………………………………………………………………………………………………………………………………………………...**33**

T7 emargination bordered by a pair of broadly triangular lobes ***and*** S3 apical margin straight to very weakly convex in outline……………………………………………………………………………………………………………….**34**

**Check – typo, I meant either S2 or S4**

**33(32).** Punctures on scutum centrally extremely close to contiguous, separated at most by linear interspaces narrower than the diameter of the punctures; projections bordering the T7 emargination

usually narrow and sharp, almost spine-like; EUS south of Great Lakes region and New England, apparently absent from SEUS also………………………………………………….……………………………..***cordata***

[**Note**: *Osmia calaminthae* is a recently-described species very similar morphologically to *cordata* but is apparently confined to the Lake Wales ridge region of central Florida; as far as known *cordata* does not occur in Florida.]

Punctures on scutum centrally very close, but separated by shiny, flat interspaces; projections bordering the T7 emargination more broadly triangular, not narrow and spine-like; hind basitarsi with distinct tooth slightly below midline; northern species, Great Lakes region and New England and into Canada …………………………………………………………….…………………………………………………………………………….***proxima***

**34(32).** S4 apical margin not produced medially, but straight in outline; penis valves very broad, broader than the gonoforceps; hind basitarsal tooth weak to absent; northeastern US and Great Lakes region, in southeast only at higher elevations (?)……………………………………………..…………….…………..***virga***

S4 apical margin weakly convex; penis valves narrower than gonoforceps; hind basitarsal tooth prominent; southeast US……………………………………………………………………………………….….***sandhouseae***

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