

## CANPOLIN - Bee Course 2012

### Key to Bee Genera in Canada

The sexes in bees can generally be differentiated by counting the number of metasomal terga – 6 in females, 7 in males, or the number of apparent segments of the antenna – 12 in females, 13 in males (excluding *Holcopasites*). The second antennal segment is sometimes largely retracted within the first, particularly in some wasp-like bees.

1. Three submarginal cells (Fig. 1)...2

One or two submarginal cells (Fig. 2)...33



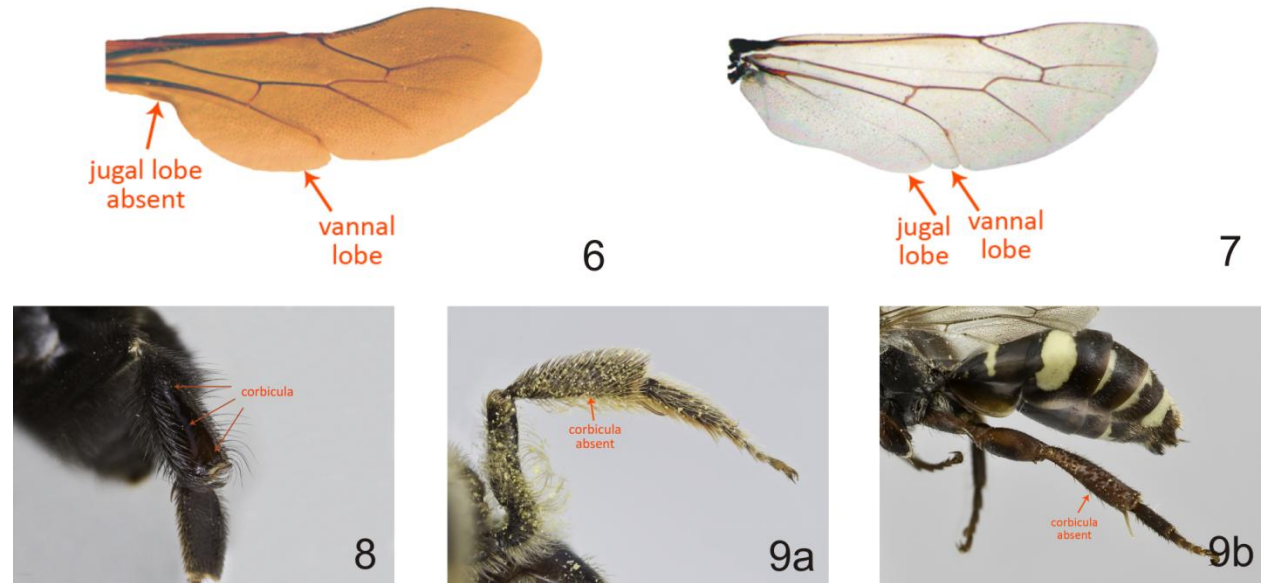
2(1). Hind tibial spurs absent (Fig. 3)...*Apis mellifera* L.

Hind tibial spurs present (Fig. 4), though sometimes hidden by hairs (Fig. 5)...3



3(2). Jugal lobe of hind wing absent (Fig. 6); females usually with hind tibia strongly expanded and with corbicular structure (Fig. 8) (the exceptions are cuckoo bumble bees, subgenus *Psithyrus*)...*Bombus*

Jugal lobe of hind wing present, but sometimes small (Fig. 7); females lacking strongly corbicular hind tibia (Fig. 9a and b)...4



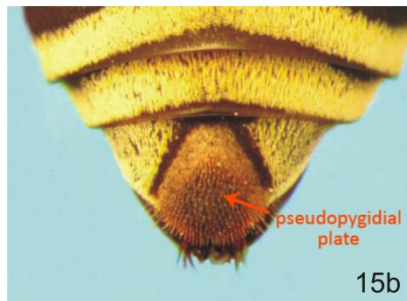
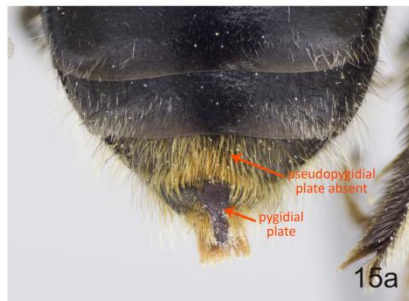
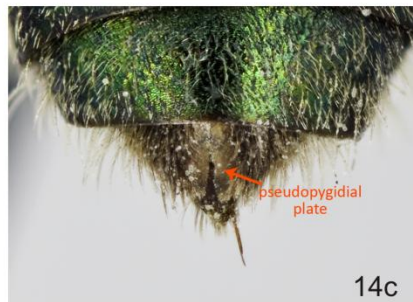
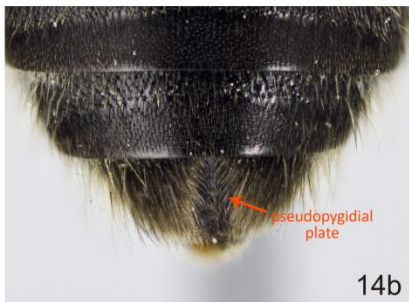
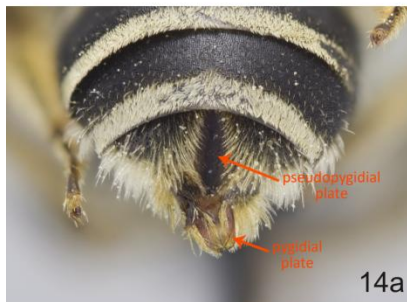
4(3). Posterior portion of second recurrent vein arcuate outwardly making the vein somewhat S-shaped on the right wing (backwards S on the left wing) (Fig. 10)...*Colletes*

Posterior portion of second recurrent vein not outwardly arcuate (Fig. 11a and b)...5



5(4). Basal vein strongly arched, especially strongly so basally (Fig. 12); females usually with narrow pseudopygidial area on T5 (Fig. 14a-c) (females lacking this area are usually shiny and black with red on metasoma, but rarely are dull metallic green-blue) (NOTE do not confuse the pseudopygidial area of T5 with the pygidial area of T6)...6

Basal vein not strongly arched towards the base (Fig. 13); pseudopygidial area usually absent (Fig. 15a), IF present THEN of different form and on broad bees with pattern of white appressed pubescence (Fig. 15b)...12



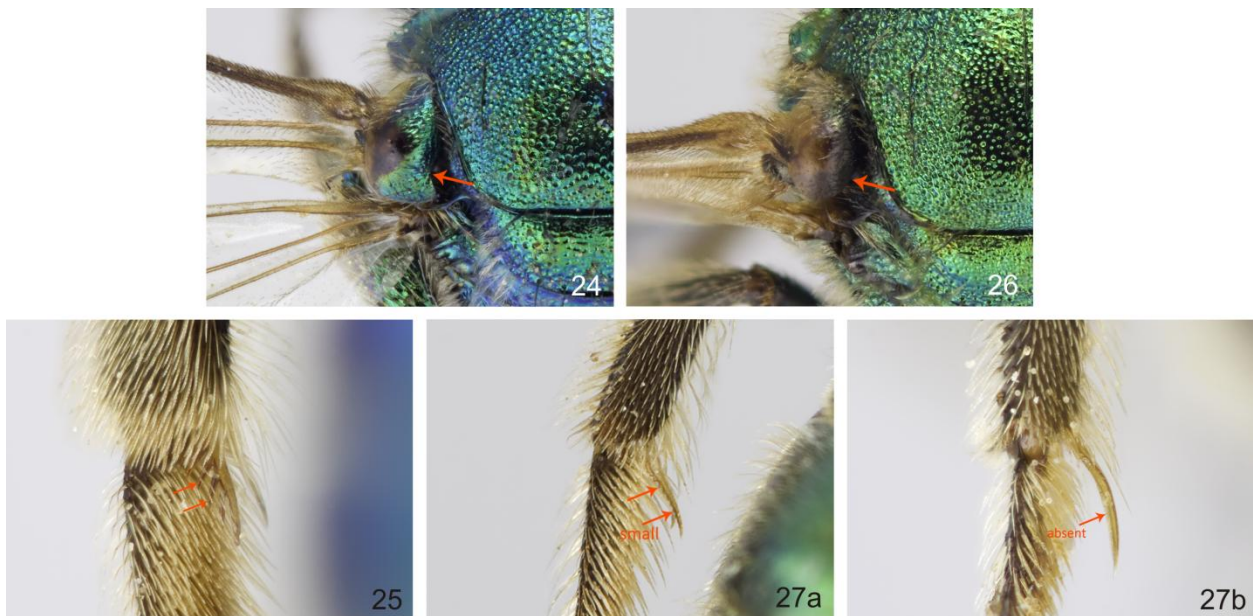
6(5). Females with pseudopygidial area distinct and divided by a deep cleft (Fig. 16) (may need verification by prodding area with a pin); male with genital opening at extreme apex of metasoma, T7 not recurved anteroventrally (Fig. 17); body in both sexes entirely bright metallic green or bronze (Fig. 18); lacking distinct carinate rim to posterior surface of mesosoma (Fig. 19)...7

Females with pseudopygidial area entire (Fig. 20) (sometimes appearing cleft due to orientation of minute hairs on surface, this can be checked by prodding with a pin) (rarely weak or lacking in species lacking a scopa); male with apex of T7 recurved anteroventrally so that genital opening is slightly in front of the apex (Fig. 21); males never entirely bright metallic, IF head and thorax bright green THEN metasoma with yellow transverse bands (Fig. 22); IF females entirely bright metallic, THEN posterior surface of propodeum entirely surrounded by a strong carina (Fig. 23)...9



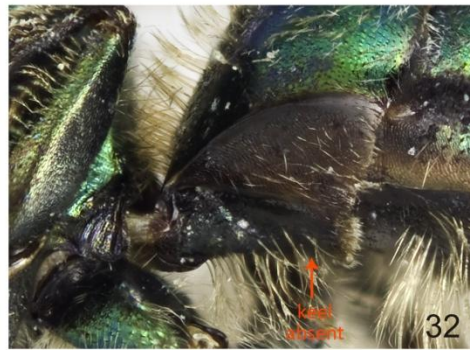
7(6). Tegula with inner posterior angle somewhat produced mesally (Fig. 24); female tibial spur with comb pronounced (Fig. 25)...*Augochloropsis*

Tegula evenly rounded posteriorly (Fig. 26); female tibial spur with comb small (Fig. 27a) or absent (Fig. 27b)...8



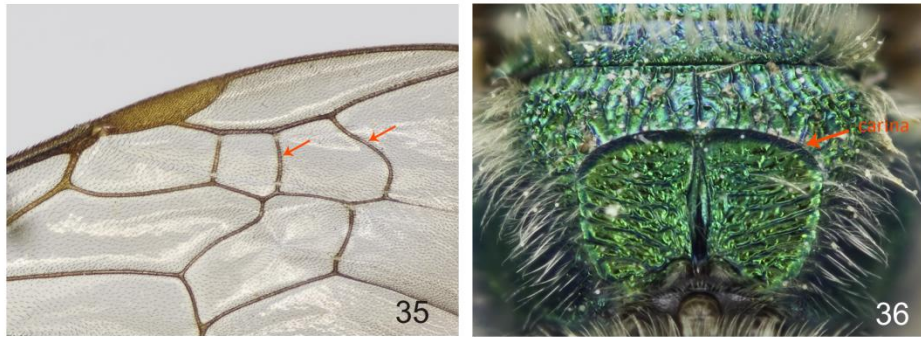
8(7). Paraocular lobe forming an acute, but rounded angle projecting onto clypeus (Fig. 28); S1 of females with a keel (Fig. 29); S4 of males with a straight margin (Fig. 30) [Marginal cell slightly truncate at apex]...*Augochlora pura*

Paraocular lobe at most forming a right angle on clypeus (Fig. 31); S1 of females without a keel (Fig. 32); S4 of males with a concave margin (Fig. 33) [Marginal cell pointed and on wing margin]...*Augochlorella*



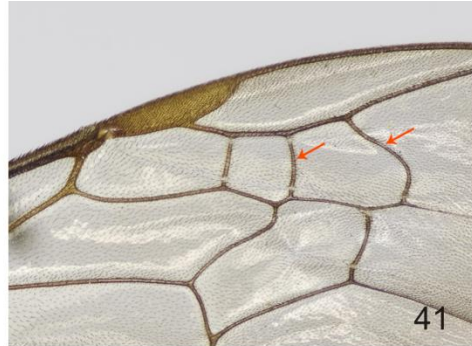
9 (6). Head and mesosoma (and often metasoma) brilliant metallic green (Figs. 34a and b); males with yellow integumental bands on metasoma (Fig. 34c); outer wing veins all strong (Fig. 35); posterior surface of propodeum encircled by a strong carina (Fig. 36); moderately large bees, at least 9mm in length...*Agapostemon*

Entire body either black, brown (Fig. 37a) or dull metallic, IF bright metallic (Fig. 37b), then smaller bees, <8mm and EITHER posterior surface of propodeum not encircled by strong carina (Fig 38) AND/OR in females one or more apical wing veins weakened (Fig. 39) AND/OR males without yellow integumental bands (Fig. 37c)...10



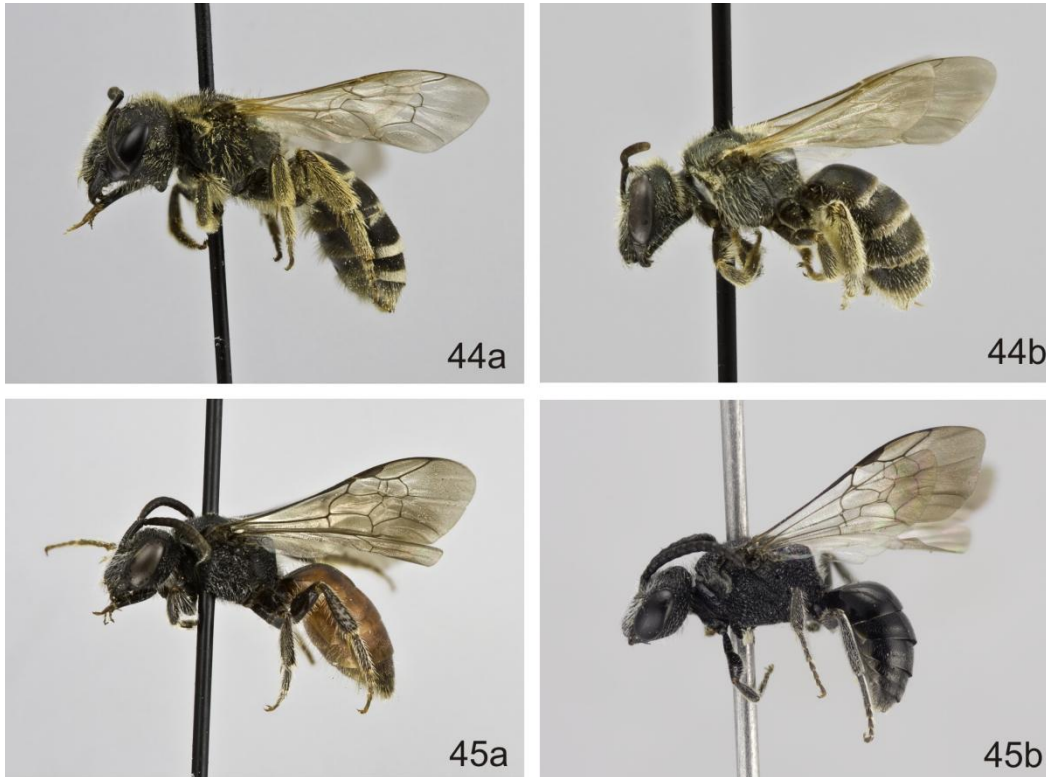
10(9). Apical wing veins weakened, at least in females (Fig. 40); metasomal hair bands, if present (females), basal in position (Fig. 42 a and b), males lacking distinct apical hair bands; IF metasoma with reddish markings (uncommon) THEN body either not shiny and/or without coarse sculpture and with distinct scopa on hind leg of female (Fig. 43a)...*Lasioglossum*

Apical wing veins strong (Fig. 41); metasomal hair bands, if present, apical in position (Fig 42c), males with or without distinct apical hair bands, IF without apical hair bands THEN metasoma usually red marked and body shiny and usually with coarse sculpture and without scopa on hind leg (Fig. 43b)...11



11(10) Metasomal terga with distinct apical hair bands (NOTE these may be abraded in older specimens in which they are generally more easily detected towards the side of the metasoma); female with distinct scopa on hind leg; integument black-brown or dull metallic blue or green (Figs. 44a and b)...*Halictus*

Metasomal terga without distinct apical hair bands; female lacking scopa; integument shiny black and red, if entirely black then body very shiny and coarsely sculptured (Figs. 45 a and b)...*Sphcodes*



12(5). Axilla produced into a rounded lobe or an angle or spine, clearly not continuing outline of scutellum (Fig. 46a and b); mostly black with bands or spots of pale appressed pubescence...13

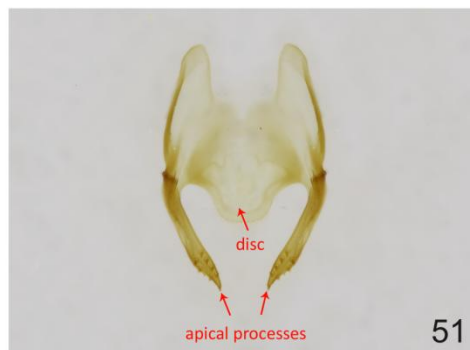
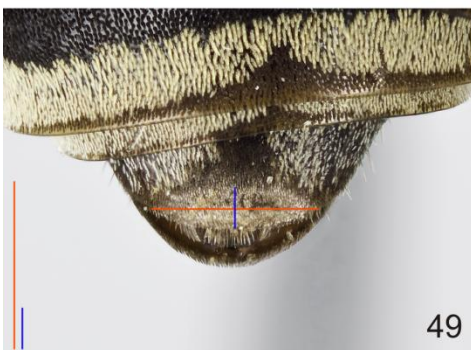
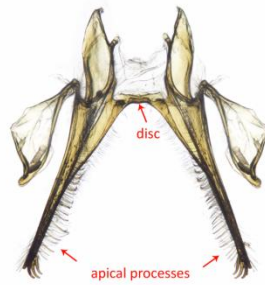
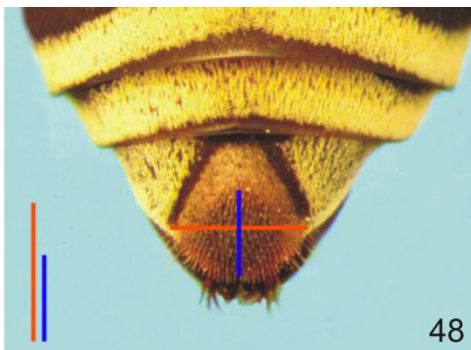
Axilla not produced, continuing outline of scutellum (Fig. 47a and b); variously coloured or patterned...14





13(12). Pseudopygidial area of female T5 at least half as long as greatest breadth (Fig. 48); S6 of female with disk reduced to a transverse bar that connects a pair of elongate processes that are almost forceps-like and with coarse spine-like setae (NOTE even if S6 is not extruded, the spines at its apex may nonetheless be visible) (Fig. 50); pygidial plate of male with lateral margins sinuate, parallel posteriorly, widened anteriorly (NOTE, the apical tergum will often have to be extended in a relaxed specimen to see this clearly) (Fig. 52)...*Triepeolus*

Pseudopygidial area of female T5 lunate, usually less than half as long as greatest breadth (Fig. 49); S6 of female with disk broad with lateral processes spatulate, with triangular teeth (IF S6 not extruded but its apex is visible THEN the triangular teeth and absence of spines should be visible) (Fig. 51); pygidial plate of male with lateral margins convergent (Fig. 53)...*Epeolus*



14(12) Metasomal terga with opalescent integumental bands (Fig. 54)...*Nomia melanderi*

Metasomal terga without opalescent bands (Fig. 55), sometimes with yellow, orange or red maculations (Fig. 56), or entirely metallic but not with opalescent bands...15



15(14). Two subantennal sutures (Fig. 57); all females and some males with facial fovea (Figs. 58a and b)...16

One subantennal suture (Fig 59); facial fovea absent (Fig. 60)...17



16(15) Female with facial fovea shallow and entirely covered in short dense velvety hairs (Fig. 61); female with propodeal corbicula (Fig. 62); male without facial fovea (Fig. 63); male with gonobase (Fig. 64)...*Andrena*

Female with facial fovea lacking dense velvety hairs (may have sparse long hairs) (Fig. 65); propodeal corbicula absent (Fig. 66); male usually with facial fovea (Fig. 67); male lacking gonobase (Fig 68)...*Protandrena* [not confirmed in Canada]



17(15). Integument of metasoma, and often mesosoma, marked with yellow, orange or red (Fig. 69a and b), sometimes entirely reddish (Fig. 69c); apical hair bands on metasomal terga absent; scopa in female absent (Fig. 70); female S6 with specialized bristles (Fig. 71)...*Nomada*

Integument of metasoma not marked with yellow, orange or red (Fig. 72a) though sometimes hairs give coloured pattern to metasoma (Fig 72b); other characters variable...18



18(17) Arolia absent (Fig. 73); male with flagellomeres 2-7 very short and broad, more than twice as broad as long (Fig. 75)...*Zacosmia maculata*

Arolia present (Fig. 74); male with antennal flagellomeres at most twice as broad as long (Fig. 76)...19



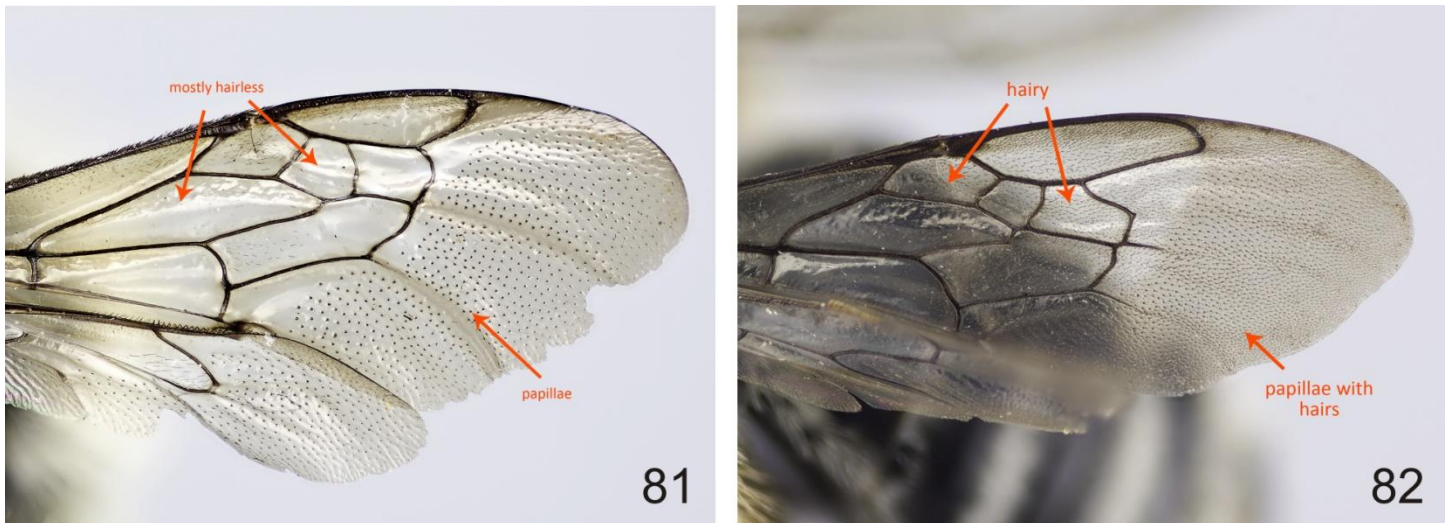
19(18). Stigma absent, marginal cell slender 7 times as long as wide (Fig. 77); metasoma lacking distinct pale hair bands or patches (Fig. 79), robust species...*Xylocopa*

Stigma present, marginal cell at most 6 times as long as wide (Fig. 78), often with pale hair bands or patches on metasoma (Fig. 80)...20



20(19). Wings with most closed cells hairless (Fig. 81)...21

Wings with closed cells with hairs (Fig. 82)...24



21(20) Scutellum with two processes (Figs. 83a), sometimes hidden among dense hair (Fig. 83b); females lacking scopa on hind legs (Fig 84)...22

Scutellum without two processes, evenly rounded (Fig. 85); females with scopa on hind legs (Fig. 86)...23



22(21) Inner ramus of claws of middle and hind legs narrow and pointed and not wider than outer ramus (Fig. 87); metasomal terga USUALLY without medially divided patches of short, pale, appressed hairs (Fig. 89)...*Melecta*

Inner ramus of claws of middle and hind legs broad and lobelike, if pointed, certainly not similar in shape to outer ramus (Fig. 88); metasomal terga with patches of short, pale, appressed hairs that are interrupted medially and do not cover the apical impressed areas (Fig. 90)...*Xeromelecta*



23(21) Anterior and posterior margins of third submarginal cell approximately equal; first recurrent vein ending near middle of second submarginal cell (Fig. 91)...*Anthophora*

Anterior margin of third submarginal cell shorter than posterior margin; first recurrent vein ending near apex of second submarginal cell (Fig. 92)...*Habropoda*



24(20) Apex of marginal cell on costal margin of forewing or pointed and approximately one vein-width from costal margin (Fig. 93) (short-tongued bees)...25

Apex of marginal cell curved away from costal margin of forewing (Fig. 94a and b) (long-tongued bees)...26



25(24) Apex of marginal cell broadly rounded (Fig. 95)...*Dieunomia*

Apex of marginal cell pointed (Fig. 96)...*Melitta americana*



26(24) Third transverse cubital vein not strongly curved inwards anteriorly, anterior margin of 3rd submarginal cell not markedly shorter than posterior margin (Fig. 97); female lacking scopa (Fig. 99)...*Epeoloides pilosula*

Third transverse cubital vein strongly curved inwards anteriorly, anterior margin of 3rd submarginal cell approximately  $\frac{1}{2}$  as long as posterior margin (Fig. 98); female with scopa on hind leg (Fig. 100)...27



27(26) Body without large areas of dense hairs obscuring underlying integument; usually shiny metallic (Fig. 101)...*Ceratina*

Body with extensive areas of dense hairs obscuring underlying integument, usually on head and mesoscutum and at least partially on metasoma; body surface never metallic (Fig. 102a and b)...28



28(27) Vertex of head evenly convex throughout (Fig. 103); second abscissa of M+Cu of hind wing less than 2/3 as long as M and less than 1.6 times as long as cu-v (Fig. 105)...29

Vertex of head flat or convex, at least between lateral ocellus and compound eye (Fig. 104); second abscissa of M+Cu of hind wing more than 2/3 as long as M and more than 1.6 times as long as cu-v (Fig. 106)...30



29(28) Proboscis in repose reaching at least to base of metasoma (Fig. 107)...*Melitoma* [not confirmed in Canada]

Proboscis in repose usually not reaching further than front coxa and never reaching base of metasoma (Fig. 108)...*Diadasia*



30(28) Tegula narrowed anteriorly (Fig. 109)...*Melissodes*

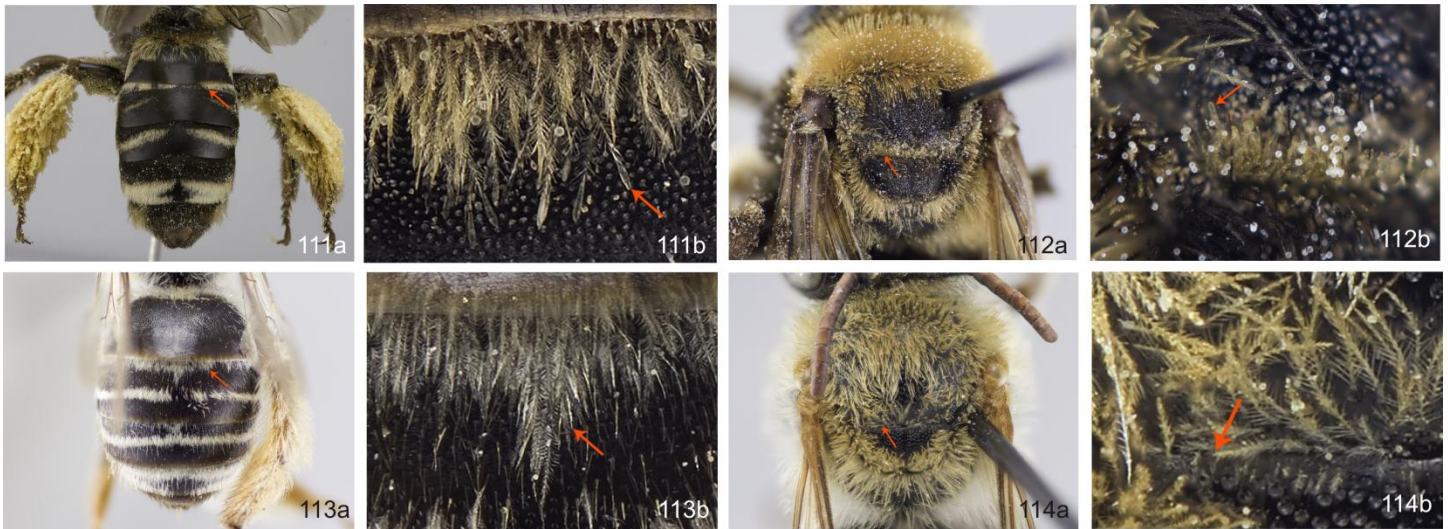
Tegula not narrowed anteriorly (Fig 110)...31





31(30) Both sexes with some shiny, spatulate hairs most easily visible on base of T2 (Fig. 111a and b) or arising from suture between mesoscutum and sutellum (Fig. 112a and b)...*Svastra*

Both sexes lacking spatulate hairs (Figs. 113a and b; 14a and b)...32



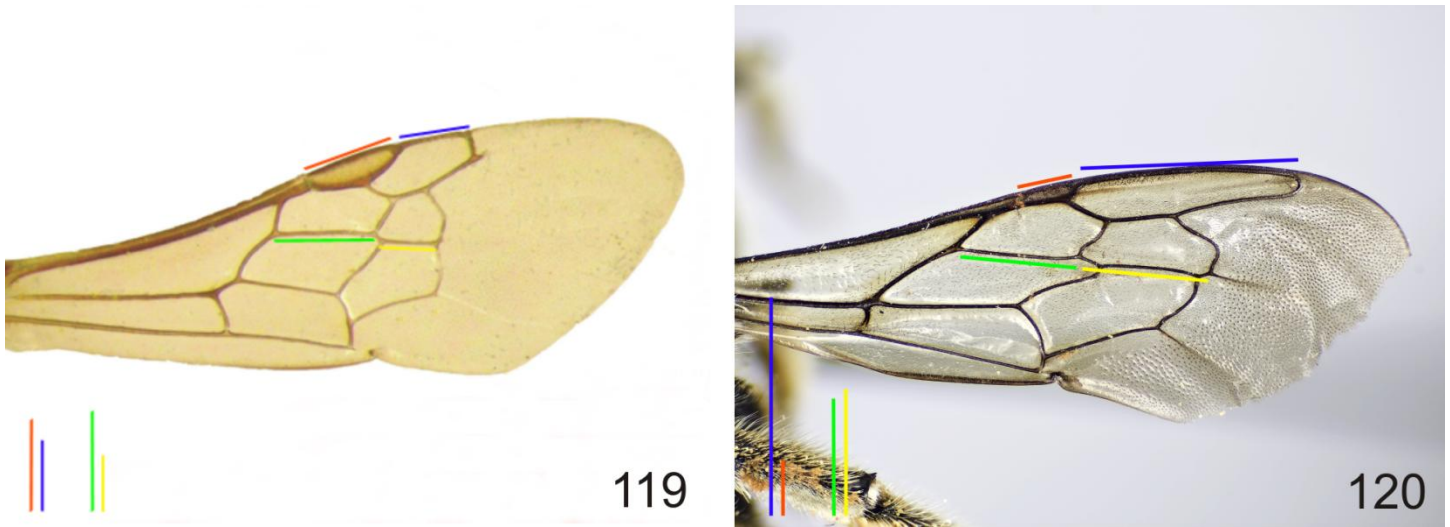
32(31) Female with hairs on inner surface of hind basitarsus comparatively sparse, not obscuring the basitarsal surface (Fig. 115); male with antennae comparatively short, not reaching stigma of forewing, flagellomeres 4-7 less than twice as long as wide, flagellum pale below (Fig. 117)...*Peponapis pruinosa*

Female with hairs on inner surface of hind basitarsus dense, obscuring the surface (Fig. 116); male with antennae elongate, reaching stigma, flagellomeres 4-7 approximately 2.5 times as long as wide, flagellum black below and above (Fig. 118)...*Eucera*



33(1). Marginal cell distal to stigma on costa little if any longer than stigma, AND, second submarginal cell if present (one species has only one submarginal cell) less than 2/3 as long as first (rarely absent) (Fig. 119); mostly very small bees less than 5 mm in length...34

Marginal cell and submarginal cells not as above (Fig. 120)...35



34(33) Body largely covered with short, appressed pale hairs (Figs. 121a and b)...*Neolarra*

Body lacking appressed hairs, metasomal terga 1-4 almost hairless (Fig. 122)...*Perdita*



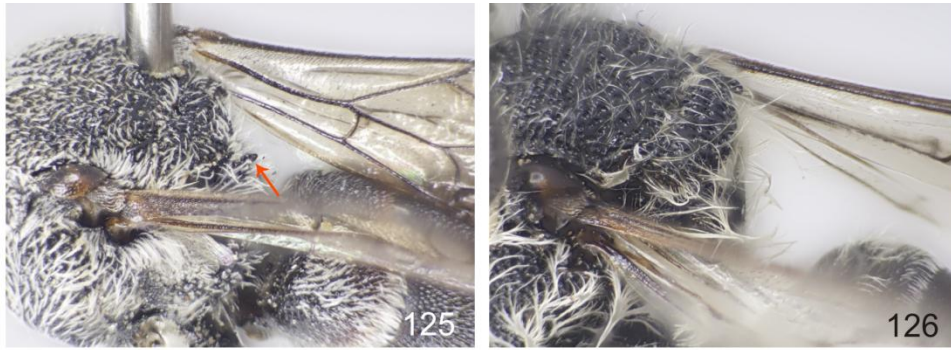
35(33). Axilla produced to a lobe, angle or spine lateral to scutellum (Fig. 123)..36

Axilla not produced as a lobe, angle or spine latera to scutellum (Fig. 124)..37



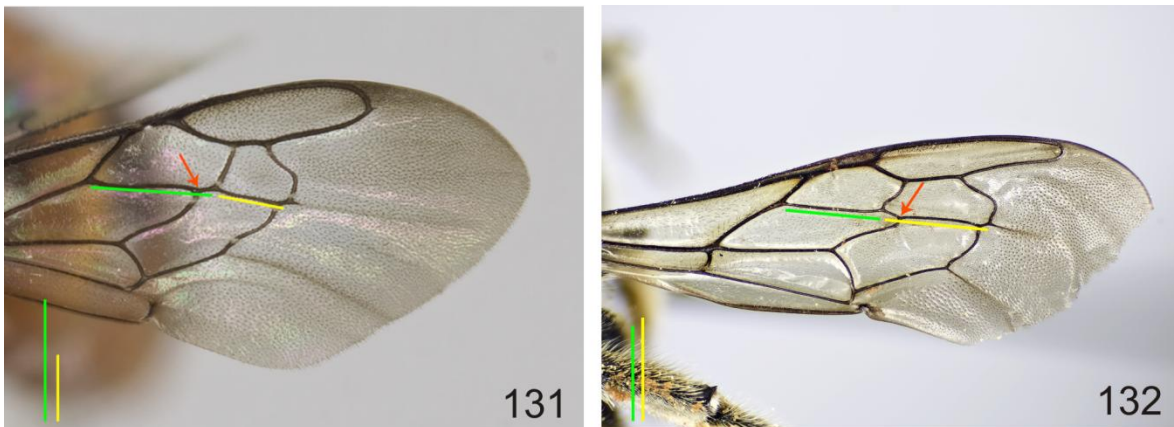
36 (35) Metanotum with medial tooth or tubercle (Fig. 125); metasoma rounded (Fig. 127), male metasoma lacking apical teeth and/or tubercles (Fig. 128; no image, but similar to female)...*Dioxys*

Metanotum lacking medial tooth or tubercle (Fig. 126); female metasoma acutely pointed (Fig. 129), male metasoma with paired teeth or tubercles (Fig. 130)...*Coelioxys*



37(35). Second submarginal cell much shorter than first, usually only half as long; first recurrent vein received by first submarginal cell or meeting first transverse cubital (Fig. 131), (IF second submarginal cell is 2/3 as long as first, THEN first recurrent vein clearly in first submarginal cell); scopa absent...38

Second submarginal cell at least 2/3 as long as first and usually receiving second recurrent vein (Fig. 132); scopa present or absent...40



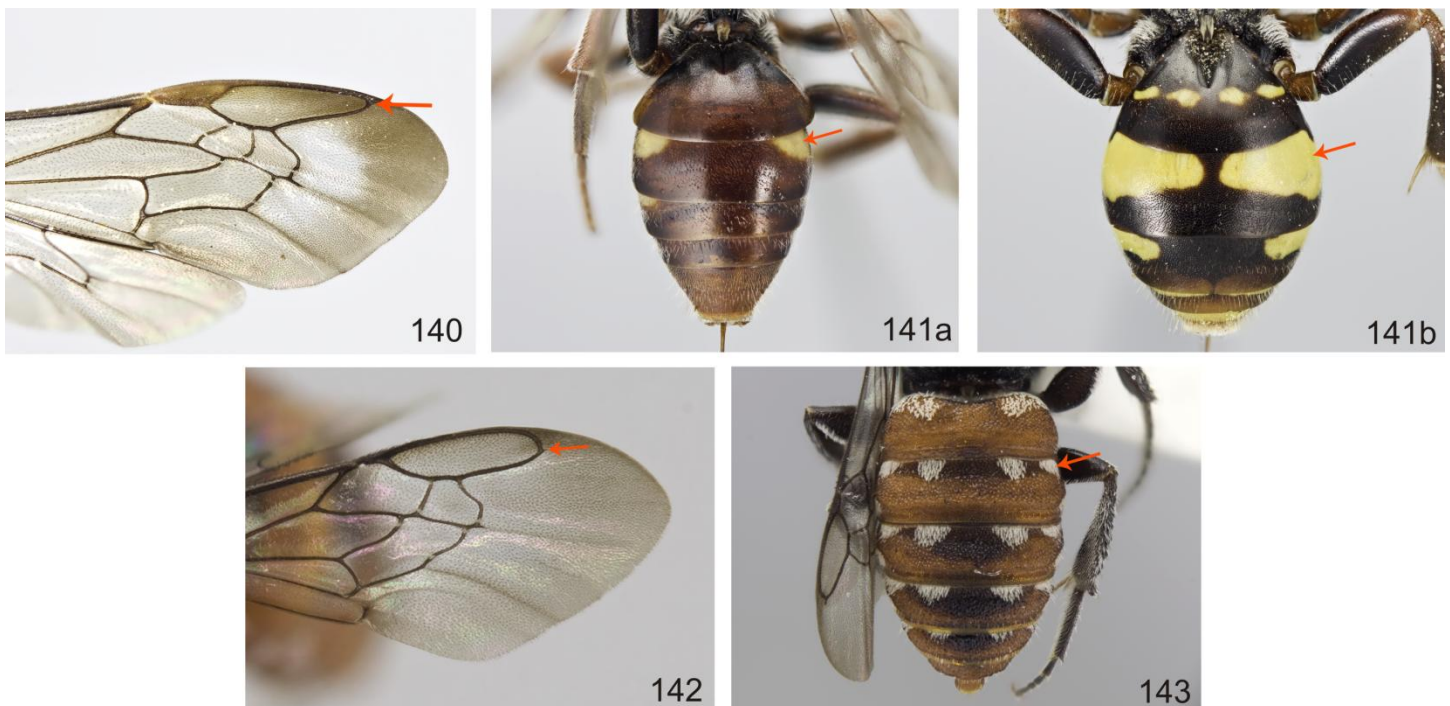
38(37) Jugal lobe of hind wing about  $\frac{3}{4}$  as long as vannal lobe (Fig. 133); glossa truncate or bilobed (Fig. 134); black bees usually with white or yellow markings on legs and face but lacking white or yellow integument on metasoma (metasoma rarely largely red) (Figs. 135a and b)...*Hylaeus*

Jugal lobe of hind wing less than  $\frac{1}{4}$  as long as vannal lobe (Fig. 136); glossa pointed (Fig. 137); yellow, orange or red markings on metasoma, sometimes entirely pale coloured (Figs. 138a and b)...39



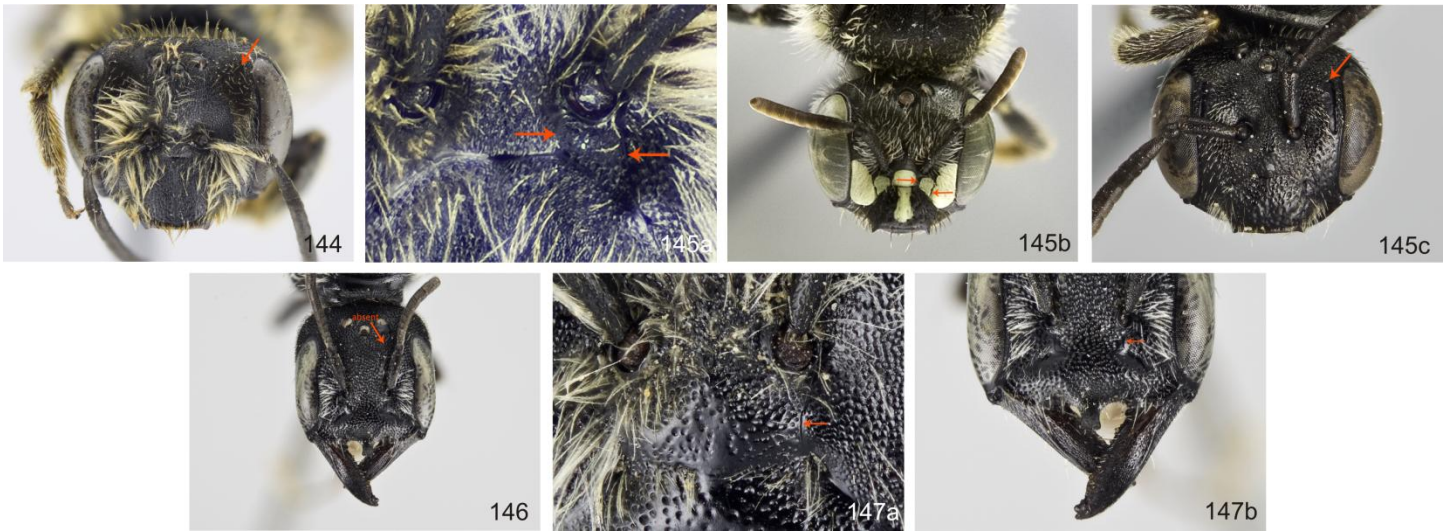
39(38). Apex of marginal cell on, or very slightly separated from, wing margin (Fig. 140); metasoma lacking discrete patches of pale appressed pubescence, IF metasoma appears spotted, THEN spots are made of coloured integument and not appressed hairs (Figs. 141a and b)...*Nomada*

Apex of marginal cell curved away from wing margin (Fig. 142); metasoma with discrete patches of pale appressed pubescence giving a spotty appearance with spots made of hairs (Fig. 143)...*Holcopasites*



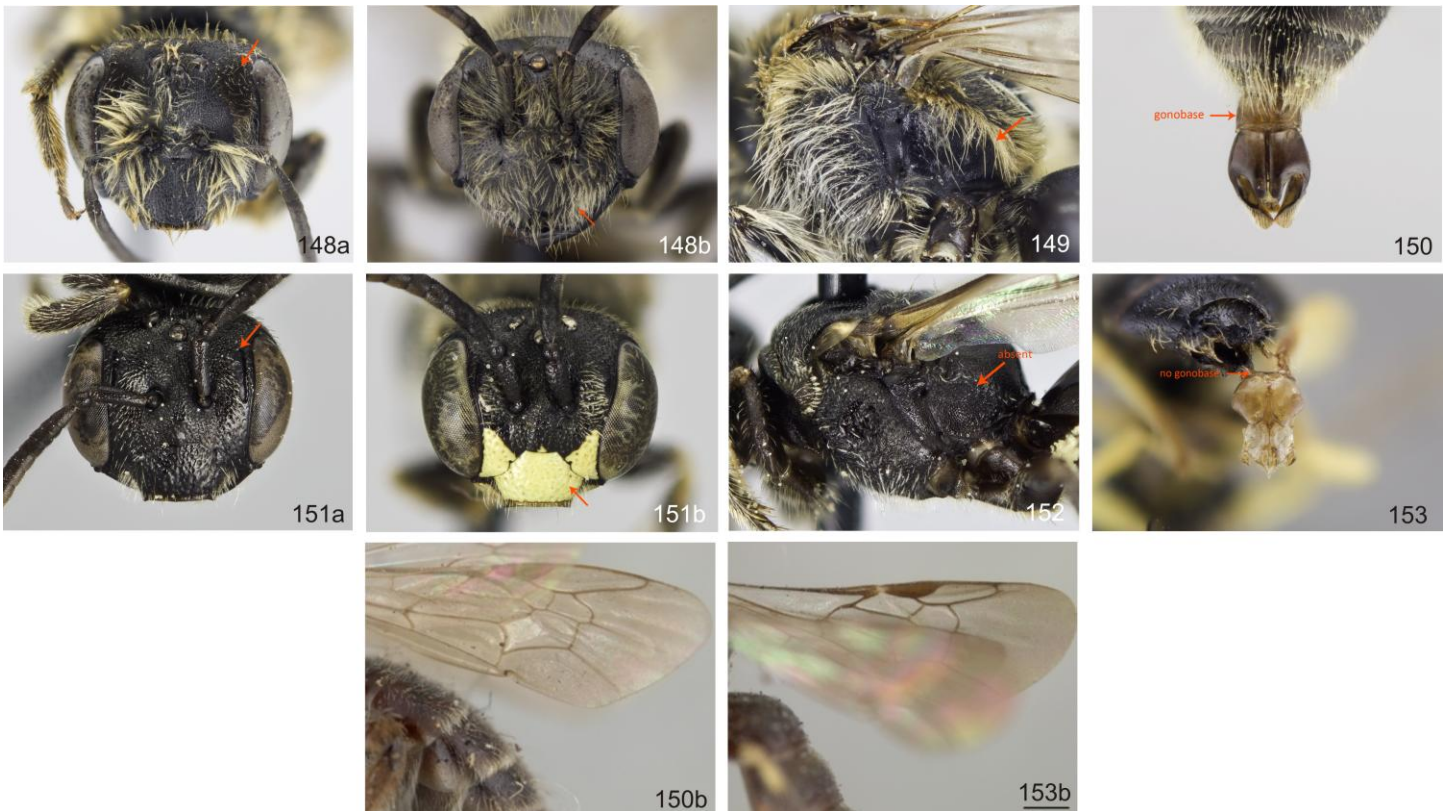
40(37). Female with facial fovea (Fig. 144); both sexes with two subantennal sutures (Figs. 145a and b), except rarely in males, such males have a discrete facial fovea that lacks hairs (Fig. 145c)...41

Neither sex with facial fovea (Fig. 146); both sexes with one subantennal suture (Figs. 147a and b)...44



41(40). Female with facial fovea present covered in short velvety hairs (Fig. 148a); both sexes usually with long dense hairs (Fig. 148b) especially the face in the male; lateral surface of propodeum with long hairs forming a corbicula in the female (Fig. 149); male with gonobase (Fig. 150) [Marginal cell pointed at apex; Fig. 150b]...*Andrena*

Both sexes with facial fovea lacking hairs (Fig. 151a); males with face not covered in long hairs (Fig. 151b); females without corbicula on lateral surface of propodeum (Fig. 152); male without gonobase (Fig. 153) [Marginal cell truncate at apex; Fig. 153b]...42



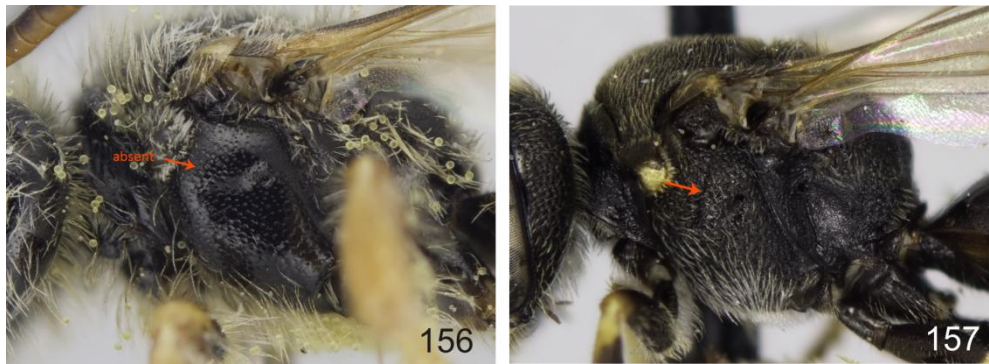
42(41) Anterior tentorial pit located in outer subantennal suture (Fig. 154a and b)...*Calliopsis*

Anterior tentorial pit at junction of outer subantennal and epistomal sutures or lower down on face entirely on epistomal suture (Fig. 155a and b)...43



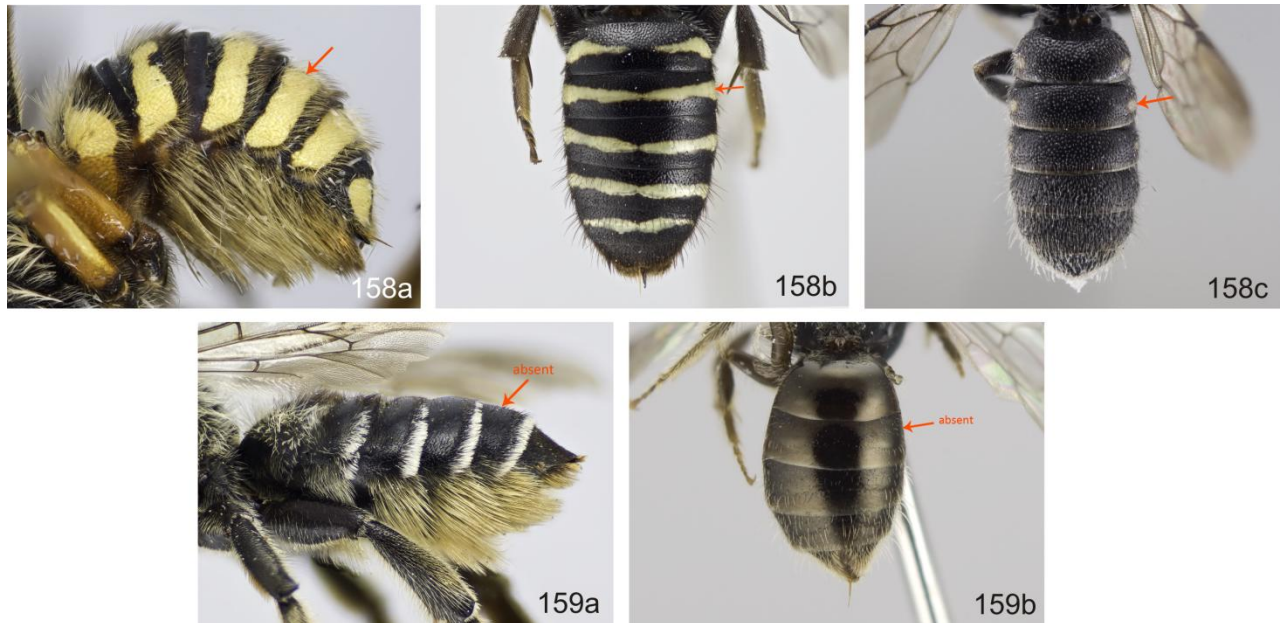
43(42) Pre-episternal groove absent at least below level of scrobe (Fig. 156)...*Panurginus*

Pre-episternal groove present (Fig. 157)...*Pseudopanurgus*



44(40). Metasoma with cream, yellow, orange or red markings or entirely pale (Fig. 158a-c)...45

Metasoma lacking cream, yellow, orange or red markings (Fig. 159a and b)...52



45(44) Basal vein strongly curved, especially towards base (Fig. 160)...*Sphecodes*

Basal vein straight, if curved then not especially strongly so towards base (Fig. 161)...46



46(45) Scape less than twice as long as wide (Fig. 162); female with T6 concave in dorsal view (Fig. 164; not shown)...*Neopasites*

Scape more than twice as long as wide (Fig. 163); female T6 not concave in dorsal view (Fig. 165; not shown)...47



47(46). Labrum broader than long or squarish (Fig. 166; figure not shown); mandible with at most one subapical tooth (Fig. 167; figure not shown); metasomal scopa absent in females (Fig. 168); males lacking strong spines or protuberances on apical metasomal segments (Fig. 169a-c; images are of females)...*Nomada*

Labrum longer than broad (Fig. 170; figure not shown); mandible with more than one subapical tooth (Fig. 171a and b) or with an untoothed margin with a preapical notch (Fig. 171c; figure not shown); metasomal scopa present (Fig. 172a) or absent (Fig. 172b) in females; males USUALLY with spines or protuberances on apical metasomal segments (Fig. 173a-d)...48



48(47). Female scopa absent (Fig. 174); male lacking spines or protuberances near apex of metasoma (Fig. 175)...*Stelis*

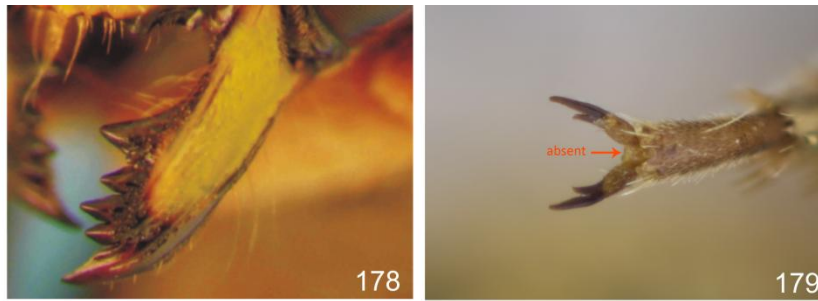
Female scopa present (Fig. 176); male metasoma with apical spines or processes (Fig. 177a-c)...49





49(48). Female mandible with at least 5 distinct teeth (Fig. 178); arolia absent (Fig. 179)...*Anthidium*

Female mandible with 3 or, at most, 4 teeth (Fig. 180a and b); arolia present (Fig. 181)...50



50(49). Anterior margin of mesoscutum angularly bent ventrally so that there is a sharp edge all the way across it (Fig. 182a and b); both sexes with 3 mandibular teeth (Fig. 183)...*Dianthidium*

Anterior margin of mesoscutum rounded (Fig. 184a and b); female with 4 mandibular teeth; male with 3 (Fig. 185)...51



51(50). Mesopleuron divided into transverse anterior and longitudinal lateral portions by a sharp carina (Fig. 186)...*Anthidiellum*

Mesopleuron not sharply divided into anterior and lateral portions (Fig. 187)...*Paranthidium*



\ 52(44). Apical wing veins reduced (Fig. 188)...*Lasioglossum*

Apical wing veins not reduced (Fig. 189)...53



53(52). Episternal groove present below scrobal groove though sometimes weak (Fig. 190); female with tibial scopa only (Fig. 191) [antennae low on face]...*Dufourea*

Episternal groove absent below scrobal groove (Fig. 192a and b); female usually lacking tibial scopa (Fig. 193) OR present on hind tibia AND hind basitarsus (Fig. 194)...54



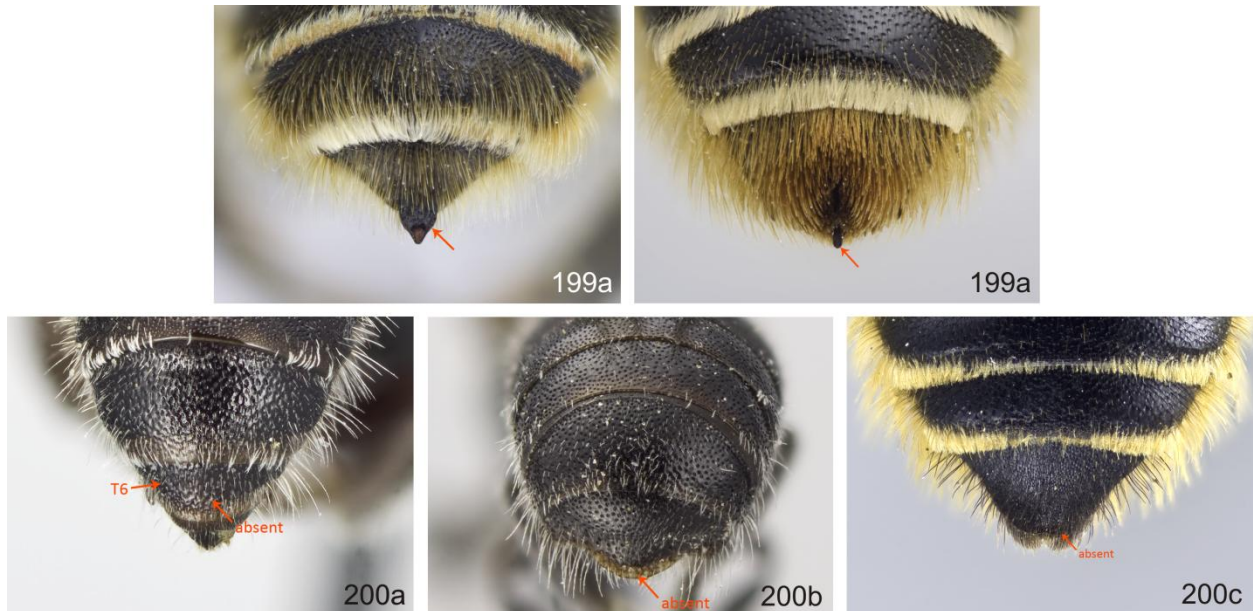
54(53). Female with scopa on hind tibia and hind basitarsus (Fig. 195); male with yellow clypeus (Fig. 196)...*Macropis*

Female with scopa lacking on hind tibia and hind basitarsus, scopa present on metasomal sterna (Fig. 197); male with black clypeus (Fig. 198)...55



55(54). Both sexes with pygidial plate (Fig. 199a), in female a narrow spine (Fig. 199b)...*Lithurgus chrysurus*

Neither sex with pygidial plate (Figs. 200a-c)...56



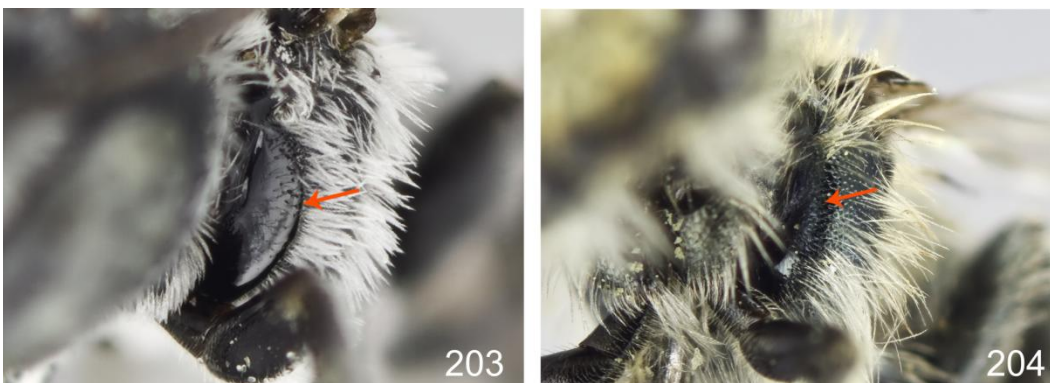
56(55). Arolia absent (Fig. 201)...*Megachile*

Arolia present (Fig. 202)...57



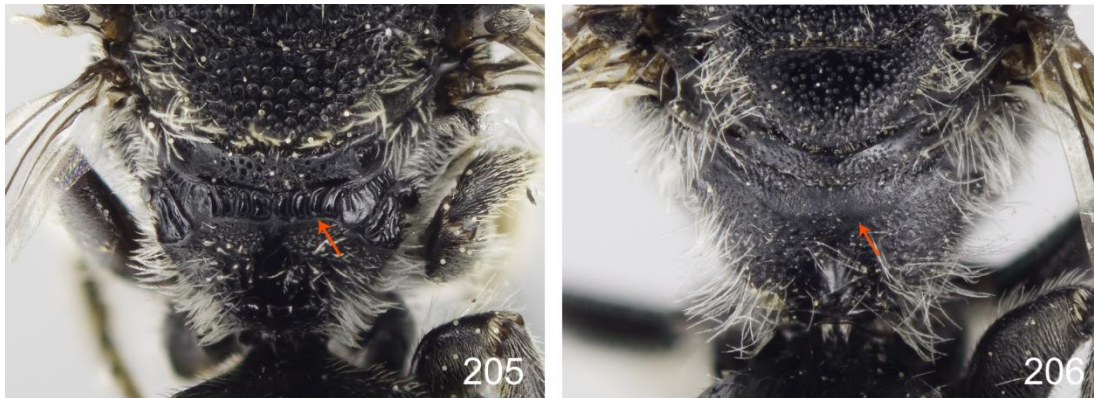
57(56). Mesopleuron distinctly divided into a largely hairless anterior surface and a hairy lateral surface, margin between the two surfaces clearly angulate (Fig. 203)...*Ashmeadiella*

Mesopleuron not clearly divided, anterior surface rounding onto lateral surface (Fig. 204)...58



58(57). Dorsal surface of propodeum horizontal, short and made up of pits, separated from posterior surface by a carina (Fig. 205)...*Heriades*

Dorsal surface of propodeum without the above combination of characteristics (Fig. 206)...59



59(58). Parapsidal lines not much longer than broad (Fig. 207)...*Osmia*

Parapsidal lines elongate (Fig. 208a and b)...60



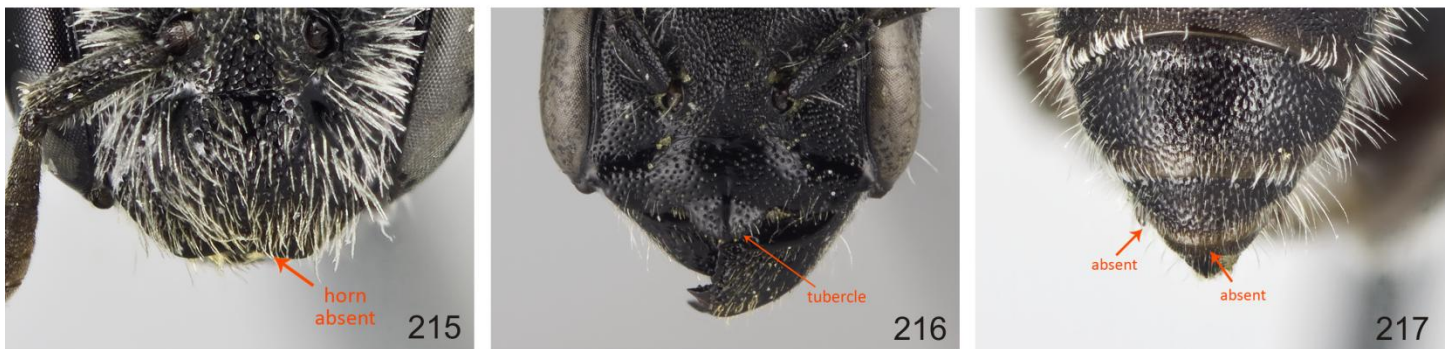
60(59). Mesosoma elongate (Fig. 209); line tangential to anterior margins of tegulae near mid length of mesoscutum (Fig. 210)...*Chelostoma*

Mesosoma not so elongate (Fig. 211); line tangential to anterior margins of tegulae considerably anterior to mid length of mesoscutum (Fig. 212)...61



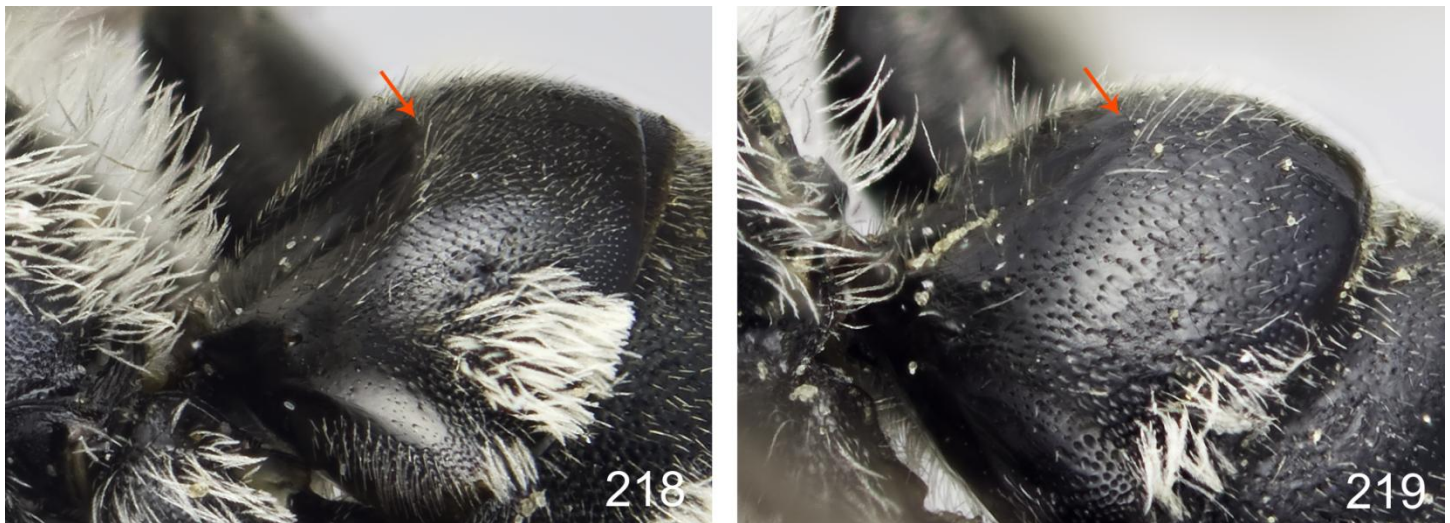
61(60) Female clypeus with apical horn that broadens from a narrow base (Fig. 213); male T6 with median apical rounded flange and broad produced angle laterally (Fig. 214)...*Protosmia ribifloris*

Female clypeus without apical horn (Fig. 215), rarely with a broadly based triangular tubercle (Fig. 216); male T6 lacking either median flange or lateral angle or lacking both (Fig. 217)...62



62(61) Anterior surface of T1 broadly flat or concave and separated from dorsal surface by a distinct carina (Fig. 218)...*Atoposmia*

Anterior surface of T1 not broadly flat or concave, with carina absent or present only medially (Fig. 219)...*Hoplitis*



## Generic Information

### **COLLETIDAE**

There are two genera of this family found in Canada and although they are very easy to tell apart from each other, unless your specimen has its glossa sticking out, you are unlikely to want to use the information below on separating them as it is easier to get to the genera using the generic key than it is to get to family using any of the keys to family. If your bee has a concave apex to the glossa then it will be a colletid and you can use the information below to tell which genus it belongs to.

All colletids line their nest with cellophane-like material secreted from the Dufour's gland. North American *Colletes* nest in the ground, with their brood cells placed end to end in a row. Most *Hylaeus* nest in hollow stems (such as blackberry and raspberry canes) but some nest in the ground and a few use vacated galls. All colletids are solitary (there are a couple of examples of nest robbing and parasocial behaviour for the family but not for North American species).

### ***Subfamily COLLETINAE***

**1. *Colletes*:** These are moderately robust, quite hairy bees, most have a densely pubescent head and thorax with pale apical metasomal bands on the terga. They have a heart-shaped head, distinct facial foveae and an S-shaped second recurrent vein – this latter is diagnostic for the genus. Some species lack distinct bands and one rare one has the metasoma covered in short, pale ferruginous hairs. There are several keys to eastern Canadian species, but all are out of date. Stephen (1954), North America; Mitchell (1960), eastern. There are at least 34 species in Canada.

### ***Subfamily HYLAEINAE***

**2. *Hylaeus*:** Superficially, these are very un-bee like bees because their hairs are short and sparse and they look almost bald. There are a few Panurginae (Andrenidae) males that might be considered similar, otherwise, the combination of concave apex of the glossa and general lack of long, dense hair is sufficient to recognize any Canadian bee as belonging to this genus. They are black bees, rarely with red on the metasoma and almost always with an entirely pale face in the males and with a triangular pale spot on the sides of the face in the females. The legs usually have white or cream coloured bands. There are some difficult taxonomic problems with this genus, some species are quite distinctive, others form unresolved complexes. Keys to them should be used with caution. Metz (1911); Snelling (multiple years). At least 17 species in Canada, probably many more.

## **ANDRENIDAE**

There are six genera of this family found in Canada. The family as a whole is relatively easily identified through the possession of two subantennal sutures. Additional characters that permit the identification of the most common genus is the existence of a facial fovea filled with velvety hairs and a subgenal coronet (an area of abundant short tubercles near the base of the mandible). Both of those characters only work for females.

Andrenids are ground-nesting bees and are commonly called solitary mining bees, although there are a few species that are communal (ie multiple females share the same nest but without a reproductive division of labour).

### ***Subfamily ANDRENINAE***

**3. *Andrena*:** The presence of two subantennal sutures and velvety facial fovea or a subgenal coronet is diagnostic for females. Two subantennal sutures combined with the presence of a gonobase is sufficient to identify the males. These bees are highly variable in size and colour. They are most common in spring, but there are summer species as well as some fall ones. Different species prefer different soil surface characteristics with some preferring bare ground, while others prefer a dense lawn, some nest on level ground, others on steep slopes. Species level identification is difficult. A series of keys by LaBerge (multiple years) and others are often very difficult to use and include large numbers of species from south of the border. *Andrena* nests are attacked by the cuckoo bees of the genus *Nomada*. There are over 130 species in Canada.

### ***Subfamily PANURGINAE***

*Tribe Protandrenini:*

**4. *Protandrena*:** The combination of two subantennal sutures, three submarginal cells and, in females, the facial fovea mostly hairless and, in males, gonobase absent, is diagnostic for this genus. These are medium sized, largely shiny comparatively bald bees. In the strictest sense, this genus has not yet been confirmed in Canada.

**5. *Pseudopanurgus*:** Two subantennal sutures, two submarginal cells, anterior tentorial pit either at junction of outer subantennal and epistomal sutures or lower down on the face and episternal groove present below level of scrobe is diagnostic for this genus. These are smallish black bees with comparatively short and/or sparse pubescence. There are no good keys for Canadian species of this genus. About 9 species in Canada.

*Tribe Calliopsini:*

**6. *Calliopsis*:** The presence of two subantennal sutures, more or less hairless facial fovea (in females), absence of a gonobase (in males) with the anterior tentorial pit in the outer subantennal suture rather than at the junction of the subantennal suture and epistomal suture or lower down on the face is a combination unique to this genus in Canada. The large amount of yellow on the face and legs of the males and the complex pale markings on the face of females are also useful identification characteristics. These are comparatively small, summer bees that seem to prefer nesting in comparatively flat sandy soil. *Holcopasites* is the cleptoparasitic apid that attacks nests of this genus. Only one species, *Calliopsis andreniformis*, is confirmed for eastern Canada; perhaps 5 species in total.

*Tribe Panurgini:*

**7. *Panurginus*:** The combination of two subantennal sutures, two submarginal cells, anterior tentorial pit either at junction of outer subantennal and epistomal sutures or lower down on the face and episternal groove absent below level of scrobe serves to identify species of this genus. These are small black bees with comparatively short and sparse pubescence. There are no good keys for Canadian species of this genus. This genus is not found in eastern Canada, 4 species in the west.

*Tribe Perditini:*

**8. *Perdita*:** The combination of marginal cell beyond stigma little if any longer than stigma, second submarginal cell at most 2/3 as long as first with body mostly shiny and not entirely covered in short, pale appressed hairs is sufficient to identify bees of this genus. Most species have most of the head and mesosoma dark metallic green or blue and the



metasoma with at least small yellow spots. The metasoma is unusually flattened. These are mostly small bees. There are no good keys for Canadian species of this genus. There are 12 species in Canada.

## HALICTIDAE

There are 10 genera of Halictids in Canada included in three subfamilies: Rophitinae (*Dufourea*), Nomiinae (*Dieunomia* and *Nomia*), and Halictinae (*Agapostemon*, *Augochlora*, *Augochlorella*, *Augochloropsis*, *Halictus*, *Lasioglossum* and *Sphecodes*).

The diagnostic characters for the family are not easily visible and are of not much practical use. Like many bees it is easier to identify Halictidae to genus than to family. The following characters are diagnostic for Halictidae: lacinia extending up the anterior surface of the labiomaxillary tube ending in a setose, finger-shaped projection; wall of proboscival fossa fused to tentorium forward almost to clypeus; articulatory process for cardo close behind clypeus. Other more useful characters are as follows: Main body of labrum wider than long, females sometimes with an apical process fringed with bristles making the entire labrum longer than broad. A single subantennal suture. **Basal vein often strongly arched**, but less so in the Rophitinae and Nomiinae.

Most Halictidae nest in the ground. Nests are typically simple with single cells, lined with waxy substance, adjoining small lateral tunnels or main branches of the nest. Cells may be widely dispersed or aggregated. In some cases, cells form a single comb-like structure with the surrounding soil excavated around it. Linear series of cells have been identified in some Australian *Lasioglossum* nests but never in the burrows of Canadian species. There are two definite examples of Halictidae nesting in rotten wood, *Augochlora pura* and *Lasioglossum (Dialictus) coeruleum*. Most *Lasioglossum* nest in the ground. At least two other *Lasioglossum (Dialictus)* may also nest in wood.

Halictidae display a wide variety of social systems. Rophitines, Nomiines and some Halictines are solitary. The Halictinae also includes species which form communal, semisocial or primitively eusocial colonies. Brood parasites are also known from the Halictinae. In Canada these parasitic species include all species of *Sphecodes* and a small number of the species rich genus *Lasioglossum*. Some Halictinae species may be polymorphic for eusociality ; reverting to solitary nesting at high altitudes or latitudes.

### **Subfamily ROPHITINAE**

Basal most branch of the Halictidae. Members of this subfamily are oligoleges (visit one or a few closely related flowers).

**9. *Dufourea*:** These are small to medium sized bees usually black to metallic in colour. The antennal sockets arise from below the middle of the face and are only narrowly separated from the upper margin of the clypeus. The clypeus is protuberant in lateral view. Fore wing with two submarginal cells. *Dufourea* are oligoleges, specializing on particular flowers. There are 8 Canadian species, *D. dilatipes*, *D. fimbriata*, *D. holocyanea*, *D. marginata*, *D. maura*, *D. monardae*, *D. novaeangeliae*, and *D. trochantera*. A revision of the Canadian species is currently nearing completion (Dumesh and Sheffield in prep).

### **Subfamily NOMIINAE**

Next most basal group of the Halictidae. Marginal cell rounded. Third submarginal cell much longer than second, similar in length to first. Episternal groove not extending much below scrobe.

**10. *Dieunomia heteropoda*:** Only species of this genus in Canada. Large, black with dark wings. Males have robust hind femora and greatly expanded hind tibiae.

**11. *Nomia melanderi*:** Only species of this genus in Canada. Medium sized, with diagnostic opalescent bands on the metasoma.

### **Subfamily HALICTINAE (the sweat bees)**

One of the largest and most common groups of bees in Canada. Characteristics of this subfamily include: basal vein strongly arched. Marginal cell pointed or narrowly truncate. Third submarginal cell usually about equal in length to second, shorter than first. Episternal groove below scrobe distinct. Female T5 with divided prepygidial fimbria. Canadian species belong to three separate tribes: Augochlorini, Halictini and Sphecodini. Augochlorini are all bright metallic bees,

including metasoma. Female T5 median specialized area notched (sometimes hard to see); male T6 without false apex. Halictinini includes some of the most commonly collected bees in North America; female T5 median specialized area not notched; male T6 with preapical carina resulting in a false apex. Sphecodini includes only the cleptoparasitic genus *Sphecodes*.

*Tribe Augochlorini:*

**12. *Augochlora pura*:** Only species in this genus in Canada. Small to medium sized, very bright green. Paraocular area of face forming an acute lobe into clypeus. Marginal cell narrowly truncate at tip. Posterior face of propodeum not fully enclosed by carinae. Female S1 with acute projection. Male S4 with posterior margin straight. Solitary nests in rotten wood.

**13. *Augochlorella*:** Small, very bright green. Paraocular area of face forming an obtuse angle. Marginal cell acute at tip. Posterior face of propodeum not fully enclosed by carinae. Female S1 without acute projection. Male S4 with posterior margin concave. Two species in Canada, *A. aurata* and *A. striata*. These are difficult to distinguish and the latter is sometimes considered a junior synonym of *A. aurata*. Eusocial ground nester. Revisions (not limited to Canadian species): Ordway 1966, Mitchell 1960, Coelho 2004.

**14. *Augochloropsis metallica*:** Only species in this genus in Canada. Medium sized, very bright green. Easily distinguished from other Augochlorini by the enlarged tegula with acute posterior angle and distinct metallic reflections.

*Tribe Halictini:*

**15. *Agostemon*:** Medium sized, very bright green. Posterior surface of propodeum completely enclosed by carinae. Females with metasoma green (or black in *A. virescens*). Males with yellow banded metasoma. Some species live in communal nests. There are 5 species in Canada: *A. angelicus* (rare), *A. radiatus*, *A. splendens*, *A. texanum*, and *L. virescens*. Revision and keys (not limited to Canadian species): Roberts (1972, 1973).

**16. *Halictus*:** These are small to medium sized bees with distinct apical bands on the metasomal terga. Larger species are black and smaller species are dull metallic. There are four black species: *H. farinosus* (Western), *H. ligatus*, *H. parallelus* (rare, only in S. Ontario) and *H. rubicundus* and three metallic ones: *H. confusus*, *H. tripartitus* (Western) and *H. virgatellus* (Western). Species nest underground in eusocial colonies, but may also be solitary. Revisions and keys (not limited to Canadian species): Sandhouse (1941), Mitchell (1960) (Eastern species), Roberts (1973) (Western species).

**17. *Lasioglossum*:** Small to medium sized bees, black to dull metallic in colour. Distal wing veins of fore wing weakened (difficult to discern in males). Metasomal terga without apical bands as in *Halictus* but sometimes with basal bands or abundant tomentum. Very numerous. Mostly ground nesting with the exception of *L. coeruleum*. Canadian species include members of four subgenera sometimes given generic status.

**Subgenus *Dialictus*:** Mostly small bees, many are dull metallic (similar in colour to metallic *Halictus*) or black. The latter have often been considered to be members of *Evyllaesus* in older studies. Weakened wing veins include both the second and third submarginal cross veins. Two species (*L. anomalum* and *L. occidentale*) lack the second submarginal cross vein entirely. The inner hind tibial spur of the female has large peg-like teeth. These are very common and difficult to identify species. There are nearly 100 species in Canada. These bees display a wide range of behaviours from solitary to eusocial. There are also a small number of socially parasitic species (formerly classified as *Paralictus*) which invade the nests of other *Dialictus*. Females of parasitic species lack pollen collecting apparatus. Revisions: Mitchell (1960) (Eastern species, black species included in *Evyllaesus*), Gibbs (in press) (metallic species in Canada). No good key exists for Western black *Dialictus*.

**Subgenus *Evyllaesus*:** Small to medium sized bees. Mostly black, although two are dull metallic. These cannot be easily distinguished from *Dialictus* especially when the two groups are examined in a global perspective. Female *Evyllaesus* are usually larger, with the lateral and posterior surface of the propodeum completely separated by a carina (also occurs in some *Dialictus*). The inner hind tibial spur of the female usually has small saw-like teeth or short blunt teeth. These bees may be solitary or primitively eusocial. There are approximately 14 species in Canada. Revisions: Mitchell (1960) (Eastern species, includes some black *Dialictus*). No good key exists for Western *Evyllaesus*.

**Subgenus *Lasioglossum s.str.*:** Larger bees, black (one metallic species in the USA occurring at least as far North as Washington state). Weakened wing veins limited to last submarginal cross vein. Males often with flattened or concave clypeus. These species are solitary. There are 17 species in Canada. Revision (not limited to Canadian species): McGinley (1986). This includes excellent, well illustrated keys to males and females.

**Subgenus *Sphecodogastra*:** Medium sized bees, very similar to, and likely derived from, *Evyllaesus*. The Canadian species of the subgenus are included by some authors in *Evyllaesus*. Females can be recognised by the modified tibial scopa which are reduced to a single row of coarse hairs like a rake. Males are very similar to *Evyllaesus* but have a longitudinal elevation on S6 and relatively elongate sterna hairs. *Sphecodogastra* are oligolectic on *Oenothera* and related plants in the Onagraceae. They usually fly early in the morning, when they use their specialized scopa to remove large amounts of the viscine pollen of *Oenothera*. There are 3 species in Canada: *L. aberrans* (Western), *L. lusorium* (Western), and *L. oenotherae* (Eastern). Revisions (not limited to Canadian species): McGinley (2003).

Tribe Sphecodini:

**18. *Sphecodes*:** These are small to medium sized bees, black usually with red metasoma. The head is wide and females lack scopa. Some species are very coarsely sculptured. All *Sphecodes* are brood parasites of other bees, particularly other Halictines or *Andrena*. There are approximately 33 *Sphecodes* in Canada and they are difficult to identify. Revision (not limited to Canadian species): Mitchell (1960) (Eastern species). No good key exists for Canadian *Sphecodes*.

## **MELITTIDAE**

There are two genera of this family found in Canada. Melittidae in Canada superficially resemble *Andrena* (see Andrenidae) though without facial fovea, and in only having one subantennal suture. Although considered short-tongued bees with respect to labial palp length, other mouth parts are similar in structure to the long-tongue bees. Recent studies of Melittidae suggest that the family is a paraphyletic or polyphyletic group from which the long-tongued bees arose (followed by Michener 2007), or the most basal branch(es) from which all other bees arose (Danforth et al. 2006). This will be discussed further in the Bee Phylogenetics lecture.

### ***Subfamily MELITTINAE***

**19. *Melitta americana*:** Only species of this genus known in Canada. Medium-sized, with strong hair bands on the metasoma. Superficially to *Andrena*, though lacking scopa on the trochanter and femur. Collected only recently in QC, Canada, in association with cranberry flowers.

**20. *Macropis*:** Our species are small to medium sized, with a shiny black, sparsely punctate metasoma with limited pale hair bands. Oil bees, restricted to flowers of the genus *Lysimachia*. (2 species, *Macropis nuda*; *M. ciliata*). Mitchell (1960) works well for the Canadian species.

## MEGACHILIDAE

There are 14 genera of this family found in Canada; all are members of the subfamily Megachilinae, which is represented by four tribes: the Osmiini, Anthidiini, Dioxyini, and Megachilini. A second subfamily, Lithurginae, (*Lithurgus chrysurus*) has not yet been confirmed in Canada.

Megachilid bees are distinct in that most non-parasitic females carry pollen on the underside of the mesosoma. All members in Canada have two submarginal cells. Non-cleptoparasitic Megachilidae are also unique in that females collect a variety of materials for nest construction versus using secretions. Such materials include mud (masons), resins, sand, pebbles, plant hairs, chewed leaves (pulp), and whole leaf sections (leafcutters). Many Megachilidae are cavity-nesters, nesting in pre-existing holes in wood or plant stems. Others are masons, and build nests attached to substrates. Many also excavate nests into the ground.

Osmiini bees range in colour from black to entirely metallic blue or green (most *Osmia*, a few *Hoplitis*, one *Atoposmia*); the only other megachilid bees with metallic colouration are some members of the cleptoparasitic genus *Stelis* (Anthidiini). Most, though not all (i.e., some *Stelis*), Anthidiini have cream-coloured maculations on the body. The Dioxyini is only a new discovery in Canada (therefore is not in the key); *Dioxys* is a cleptoparasite of Osmiini. The Megachilini includes the leafcutter and mason bees of the genus *Megachile*, and their main cleptoparasite, *Coelioxys*.

### **Subfamily MEGACHILINAE**

Tribe Osmiini:

**21. *Ashmeadiella*:** Small, robust bees, mostly black though occasionally with a red metasoma, and with pale hair bands apically on the terga. Anterior surface of tergum 1 concave and delimited by a carina (similar to *Heriades*). Males with four teeth on the sixth tergum. There are 3 species known in Canada. Michener (1939); Hurd and Michener (1955).

**22. *Atoposmia*:** Small, very similar to *Osmia* (below), though with a more elongate parapsidal lines. One species is known from Canada (*Atoposmia copelandica*), though a few others may be present.

**23. *Chelostoma*:** Minute to small bees, very slender and elongate. Black. Metasoma of male not tightly curled under. There are 3 species known in eastern Canada (two are introduced), possibly a few more in western Canada. Buck et al. (2005).

**24. *Heriades*:** Small, black bees with pale and narrow apical tergal hair bands. Anterior surface of tergum one concave and delimited by a carina. Metasoma of male tightly curled under, making it hard to see beyond tergum 3. Bodies of both sexes rather coarsely sculptured. There are 4 species in Canada. Michener (1938).

**25. *Hoplitis*:** Most are brown/black and non-metallic, though two species occurring in the west are brilliant metallic green. Typically more elongate than similar-sized *Osmia*, with parapsidal lines which are many times longer than wide. There are 12 species in Canada. Michener (1947); Mitchell (1962).

**26. *Osmia*:** Small to rather large. Most *Osmia* are metallic blue or green, with a few species entirely black. The punctiform parapsidal lines of *Osmia* distinguish it from all other osmiine bees, though in one subgenus ( ) these are more elongate. Among the Megachilidae in Canada, only *Osmia* winter as adults, emerging early in the spring and pollinating many vernal wild flowers and crops. One of our largest bee genera in Canada, with over 60 species. There are no good keys to the species of Canada. Mitchell (1962), eastern species is incomplete; Sandhouse (1939); Michener (1949); Rust (1974); White (1952).

**27. *Protosmia rubifloris*:** Rather small, black, the female is distinct in having a slender medial projection on the apical edge of the clypeus (not to be confused with the prominent horn on *Hoplitis robusta*).

Tribe Anthidiini:

**28. *Anthidiellum notatum*:** Moderate sized, distinguishable from other anthidiines by the very robust body. Constructs nest from with pebbles and resins in the open on twigs, etc.

**29. *Anthidium*:** Moderate-sized to large. The mandibular dentition of the female is unique among the anthidiine bees in Canada. Constructs nest cells with plant hairs; nests in pre-existing cavities, between stones, or in the ground. There are about 10 species in Canada. Schwartz (1929) (though not good for many species).

**30. *Dianthidium*:** Medium sized, black bees with yellow or white markings. Tergum 7 of male curled under. Both Sexes with 3 mandibular teeth. Anterior margin of mesoscutum angularly bent ventrally, leaving a sharp edge. There are at least 6 species in Canada, mostly western. Nests of pebbles and resins, on stones or branches, or in the ground. Schwartz (1926), Timberlake (1943), Grigarick and Strange (1968).

**31. *Paranthidium jugatorum*:** Uncommon, can be distinguished from anthidiine genera by the presence of arolia, a rounded anterior profile to the mesoscutum, and the anterior portion of the mesopleuron which is not separated from the lateral surface by a sharp carina. It nests in sandy soil and lines the brood cells with resin (Evans, 1993).

**32. *Stelis*:** Small to moderate sized bees, cleptoparasites of other anthidiines and osmiines. Black or dark blue, most often with cream-coloured maculations (though not always). No keys are available. There are at least 18 species in Canada.

Tribe Dioxyini:

**32. *Dioxys*:** Newly recorded for Canada (L. Best 2009). Only 1 species in Canada (*D. pacificus*). Cleptoparasites of Megachilinae.

Tribe Megachilini:

**34. *Coelioxys*:** Moderate sized, distinctive bees. Hairy eyes, pointed metasoma of female, spiked metasoma of males make these cleptoparasities distinct. There are at least 14 species in Canada. Revision for Canada in progress. Mitchell (1962) for eastern species.

**35. *Megachile*:** Small, to rather large bees. The leafcutting bees are readily identified by the combination of metasomal sternal scopa, lack of arolia and lack of yellow integumental markings. Females which cut leaf pieces for nesting have distinct cutting edges between teeth, most of those that do not are resin collectors. There are 36 species in Canada (Sheffield et al. in press).

## **APIDAE**

### ***Subfamily XYLOCOPINAE***

Tribe Xylocopini:

**36. *Xylocopa virginica*:** The large size, lack of a stigma, and narrow marginal cell will distinguish the large carpenter bees from all other genera in Canada. Known from Ontario, these bees primarily nest in human-made wooden structures such as picnic tables and benches. Males have a large pale maculation on the clypeus.

Tribe Ceratinini:

**37. *Ceratina*:** Typically small, rather slender, shiny metallic blue green bees, with little pubescence; usually with ivory maculations at least on the legs, also usually on the clypeus of females and males. Small carpenter bees, nesting in pithy stems. Daly (1973) for North America, Mitchell (1962), Rehan and Richards (2009).

### ***Subfamily NOMADINAE***

Tribe Nomadini:

**38. *Nomada*:** Slender, sparsely haired and wasp-like. The bold reddish-orange body colour, often with black and/or yellow maculations (not appressed hair patches) will distinguish these cleptoparasites from all other bees in Canada. Cleptoparasites, mostly of *Andrena* (though other families too). No keys to species. At least 40 species in Canada, probably many more.

Tribe Epeolini:

**39. *Epeolus*:** Very similar to the following genus (*Triepeolus*); rather small to medium-sized bees, usually black and occasionally with red areas, with areas of pale appressed pubescence. In females, the processes of S6 are spatulate with setae represented by small denticles; males have a pygidial plate with the margins converging. Cleptoparasites of *Colletes* (summer flying species). No published key to species. There are at least 16 species in Canada.

**40. *Triepeolus*:** Very similar to the preceding species; females differing in the processes of sternum 6 which are long and rod-like, with the setae elongate; males with the pygidial plate with sinuate margins. Cleptoparasites of eucerine bees (*Eucera*, *Melissodes*, *Peponapis*, *Svastra*). Rightmyer (2008) provides keys to the species of North America. There are at least 20 species in Canada.

Tribe Ammobatoidini:

**41. *Holcopsites*:** Small, black but usually with a reddish metasoma with spots or bands of pale appressed pubescence. Cleptoparasites of *Calliopsis*. Hurd and Linsley (1972). There are 4 species in Canada, only one occurs in the east.

Tribe Neolarrini:

**42. *Neolarra*:** Very small to small, slender bees, black or with metasoma red; body largely covered with short, appressed pale hairs. Two species in Canada, one (*N. mallochi*) unique in having only one submarginal cell. Cleptoparasites of *Perdita*. Shanks (1978).

Tribe Biastini:

**43. *Neopasites*:** The two undescribed species in Canada were collected only recently (L. Best) in BC. These are small to medium sized bees, with a reddish metasoma, and a quadrate scape. Cleptoparasites of *Dufourea*. Linsley (1943, as *Gnathopasites*)



## **Subfamily APINAE**

### Tribe Osirini:

**44. *Epeoloides*:** This bee is easily identified as a cleptoparasite (therefore lacking a scopa) that has no discrete patches or bands of appressed, pale- coloured hairs. The one North American species, *E. pilosula* (Cresson), was thought to be extinct until rediscovered in Nova Scotia (Sheffield et al., 2004). *Epeoloides* attacks the nests of *Macropis*. It is extremely rare.

### Tribe Emphorini:

**45. *Diadasia*:** Rather small to moderate sized bees. Hairy bees, the body often completely covered in, or with strong bands of pale hair. There are 3 species in western Canada. No key to the species.

**46. *Melitoma taurea*:** The rather elongate proboscis, and areas of dark and pale hair on the mesoscutum distinguish this genus from *Diadasia*. Not yet recorded from Canada.

### Tribe Eucerini:

**47. *Eucera*:** Moderate to large sized bees, males with long antennae (like *Melissodes* and *Svastra*). The species in Canada belong to the subgenus *Synhalonia*. There are 7 species in Canada. Timberlake (1969).

**48. *Melissodes*:** Robust, medium to rather large solitary ground-nesting bees. The males, like most other eucerines have extremely long antennae. *Melissodes* can be separated by the narrowed anterior portion of the tegula. Mitchell (1962) can be used to separate the ten species in the east, though no key exists for all 25 or so Canadian species. LaBerge (1956a, b and 1961).

**49. *Peponapis pruinosa*:** The Hoary Squash Bee. This species is most easily identified through its host association: it is oligolectic on cucurbits (*Cucurbita*, Cucurbitaceae) and readily found in gardens in southern Ontario. This is a solitary ground-nesting bee found from mid to late summer. Unlike the other eucerines in Canada, males of *Peponapis* have relatively short antennae. Information on this species from Ontario was presented by Kevan et al. (1989).

**50. *Svastra obliqua*:** Large bee, similar to *Melissodes* by the enormously long antennae in the male. Distinguished from *Melissodes* (and all other bees) by the spatulate hairs on some parts of the body (see the key for details). It is rarely collected in Canada.

### Tribe Anthophorini:

**51. *Anthophora*:** Medium to large, robust bees, some superficially resembling bumble bees. Very similar to *Habropoda*, differing in having the anterior and posterior margins of third submarginal cell approximately equal; first recurrent vein ending near middle of second submarginal cell. Seven or more species in Canada. Brooks (1983) for some species; Mitchell (1962) for eastern species, though many synonymies are now known.

**52. *Habropoda*:** Medium to large robust bees, very similar to *Anthophora*, differing in having anterior margin of third submarginal cell shorter than posterior margin; first recurrent vein ending near apex of second submarginal cell. Two or three species in Canada, no key.

### Tribe Melectini:

**53. *Melecta*:** Large; largely black with reddish or pale pubescence on the the thorax and often first and second terga, usually without medially divided patches of short, pale, appressed hairs; inner ramus of claws of middle and hind legs narrow and pointed and not wider than outer ramus. Cleptoparasites of *Anthophora* and *Habropoda*. Three species in Canada, all western. Hurd and Linsley (1951).

**54. *Xeromelecta*:** medium to rather large, black with pale pubescence, metasomal terga with patches of short, pale, appressed hairs that are interrupted medially and do not cover the apical impressed areas. Cleptoparasites of *Anthophora*. One or two species reported for Canada, western. Hurd and Linsley (1951).

**55. *Zacospia maculata*:** Small, Metasoma patterned with patches of pale gray or brown due to short, appressed hair. Cleptoparasite of small *Anthophora* (subgenus *Heliophila*, which have not yet been confirmed in Canada).

Tribe Bombini:

**56. *Bombus*:** Bumble bees; very large, black hairy bees with areas with yellow, orange-brown, and/or white pubescence. Females (excluding the social parasitic subgenus *Psithyrus*) carry wet pollen in a corbicula. Winter as a mated queen, eusocial. There are 43 species in Canada. Lavery and Harder (1988) for eastern species; Stephen (1957) and Thorp et al. (1983) for the western species.

Tribe Apini:

**57. *Apis mellifera*:** The ubiquitous honey bee, this introduced species is the only one in Canada to winter as a colony. Like the closely related bumble bees (*Bombus*), honey bees possess a corbicula for carrying wet pollen loads. These bees have hairy eyes, and lack tibial spurs.