FAMILY ANDRENIDAE

The bees in this family are small to medium size. The wings have either two or three submarginal cells. The mouth parts also vary as to length, the more usual condition being a short, pointed glossa and segments of the labial palpi about equal in length. The glossa sometimes is elongated, however, and the basal segments of the palpi also considerably lengthened in comparison with the apical segments. The presence of two subantennal sutures beneath each antennal fossa is a distinctive feature in this family, but is sometimes difficult to see in densely pubescent forms. Females have a distinct triangular pygidial area at the tip of the abdomen, and facial foveae usually are well developed. These characters are less evident or absent in the males.

The genus *Andrena* alone represents the subfamily Andreninae in the East, but in the West, two other genera, *Megandrena* and *Ancylandrena* have a limited distribution. The subfamily Panurginae includes all of the remaining genera in the East.

In the key that follows, the genus *Nomadopsis* has been included, even though it seems to be strictly western in its distribution. Provancher described two species of *Calliopsis*[1] from Ontario which have since been assigned to *Nomadopsis*. The types of these two species cannot now be located, so it has not been possible to determine the authenticity of the generic determination. According to J. G. Rozen, who has recently revised the genus *Nomadopsis*, the group is restricted to the far West, and the easternmost authentic record of any species is western Nebraska. There is considerable doubt, therefore, that any of the species occur in the East, and the Provancher species either were erroneously determined as to genus, or the locality record was in error.

KEY TO GENERA

1. With three submarginal cells 2
   With but two submarginal cells 3

2. Marginal cell narrowly rounded apically; females with relatively broad and densely pilose facial foveae ..... *Andrena* (p. 86)
   Marginal cell obliquely truncate apically; facial foveae of females small, not pilose ..... *Psaenythia* (p. 286)

3 (1). Marginal cell very short, about equal in length to stigma, abruptly truncate apically ..... *Perdita* (p. 295)
   Marginal cell much longer than stigma 4

4. Abdominal terga with conspicuous yellow spots or transverse bands ..... *Nomadopsis*
   Abdominal terga not maculated, with at most the apical depressed margins ferruginous or subhyaline 5

5 (4). Stigma very small; recurrent veins about equidistant from transverse cubital veins ..... *Calliopsis* (p. 287)
   Stigma large; recurrent veins usually not equidistant from transverse cubital veins 6

6. Tip of marginal cell narrowly rounded ..... *Andrena* (part) (p. 86)
   Tip of marginal cell truncate 7

7. First recurrent vein nearly interstitial with 1st transverse cubitus, 2nd considerably removed from 2nd transverse cubitus ..... *Panurginus* (p. 258)
   Second recurrent vein entering 2nd submarginal cell nearer its apex than 1st does to base ..... *Pseudopanurgus* (p. 263)

[1] *Calliopsis interrupta* and *C. 4-lineata* Provancher, 1888. Addit. Corr. Faune Ent. Canada Hym., pp. 319 & 320.

Andrena Fabricius

(Figs. 1, 2 & 4)

Andrena Fabricius, 1775. Systema Ent., p. 376.
Type: *Apis helvola* Linnaeus. Desig. by Viereck, 1912.

Anthrena Illiger, 1801. Mag. Insektenk. 1, p. 127. Emendation.

Anthocharessa Gistel, 1850. Isis (Encycl. Ztschr.) 6, p. 82.
Type: *Apis helvola* Linnaeus.

Simandrena Perez, 1890. Actes Soc. Linneene Bordeaux 44, p. 174.
Type: *Andrena propinqua* Schenck. Desig. by Hedicke, 1933.

Parandrena Robertson, 1897. Acad. Sci. St. Louis, Trans, 7, p. 337.
Type: *Panurgus andrenoides* Cresson. Desig. by Cockerell, 1897.

Micrandrena Ashmead, 1899. Amer. Ent. Soc. Trans. 26, p. 89.
Type: *(Micrandrena pacifica* Ashmead) = *Andrena melanochroa* Cockerell Monob. and orig. desig.

Iomelissa Robertson, 1900. Acad. Sci. St. Louis, Trans. 10, p. 50.
Type: *Andrena violae* Robertson. Monob.

Trachandrena Robertson, 1902. Amer. Ent. Soc. Trans. 28, p. 189.
Type: *Andrena rugosa* Robertson. Orig. desig.

Ptilandrena Robertson, 1902. Amer. Ent. Soc. Trans. 28, p. 192.
Type: *Andrena erigeniae* Robertson. Orig. desig.

Opandrena Robertson, 1902. Amer. Ent. Soc. Trans. 28, p. 193.
Type: *Andrena cressonii* Robertson. Orig. desig.

Pterandrena Robertson, 1902. Amer. Ent. Soc. Trans. 28, p. 193.
Type: *Andrena pulchella* Robertson. Orig. desig.

Andrena (Gonandrena) Viereck, 1917. Amer. Ent. Soc. Trans. 43, p. 390.
Type: *Andrena (Gonandrena) persimulata* Viereck. Monob.

Andrena (Conandrena) Viereck, 1924. Canad. Ent. 56, p. 20.
Type: *Andrena bradleyi* Viereck. Monob. and orig. desig.

Andrena (Cnemidandrena) Hedicke, 1933. Berlin Zool. Mus. Mitt. 19, p. 212.
Type: *(Melitta) Andrena nigriceps* (Kirby). Orig. desig.

Andrena (Gymnandrena) Hedicke, 1933. Berlin Zool. Mus. Mitt. 19, p. 213.
Type: *(Apis) Andrena thoracica* (Fabricius). Orig. desig.

Andrena (Leucandrena) Hedicke, 1933. Berlin Zool. Mus. Mitt. 19, p. 216.
Type: *(Apis) Andrena sericea* (Christ). Orig. desig.

Andrena (Schizandrena) Hedicke, 1933. Berlin Zool. Mus. Mitt. 19, p. 218.
Type: *Andrena antica* Morawitz. Orig. desig.

Andrena (Taeniandrena) Hedicke, 1933. Berlin Zool. Mus. Mitt. 19, p. 219.
Type: *(Melitta) Andrena ovatula* (Kirby). Orig. desig.

Andrena (Thysandrena) Lanham, 1949. Calif. Univ., Pubs., Ent. 8, p. 213.
Type: *Andrena candida* Smith. Orig. desig.

Andrena (Micandrena) Lanham, 1949. Calif. Univ., Pubs., Ent. 8, p. 217.
Type: *Andrena imitatrix* Cresson. Orig. desig.

Andrena (Cryptandrena) Lanham, 1949. Calif. Univ., Pubs., Ent. 8, p. 222. Preocc.
Type: *Andrena carlini* Cockerell. Orig. desig.

Andrena (Bythandrena) Laham, 1950. Ent. News 61, p. 140. N. name for *Andrena (Cryptandrena)* Lanham.
Type: *Andrena carlini* Cockerell. Orig. desig.

Most species of *Andrena* have three submarginal cells in the front wing (fig. 1), the marginal cell narrowly rounded apically with the tip closely approximate to the costal margin. In many of the males the clypeus is yellow, and in addition there may be lateral yellow maculae between the clypeus and lower inner orbits. The females of a very few of the eastern species also have yellow maculae on the face or clypeus. The facial foveae are well developed in the females, usually quite broad, at least toward the upper end, and are densely pilose. None of the species have any yellow or pale markings on either the thorax or abdomen.

These bees nest in the soil, sometimes gregariously, and occasionally do some damage by making these burrows in lawns. Such injury is usually of brief duration, however, for the period of flight is quite short. The biology of a few of the species has been studied.[1] Species are either vernal or autumnal, and with many the flight period is very short, being correlated apparently with the blooming period of limited groups of plants.

This genus is an extremely large one, with hundreds of species known from the northern hemisphere of both the Old and New Worlds. Along with this multiplicity of species there is a considerable diversity in size, structure and to some extent coloration. If a logical grouping of these into smaller genera or into subgenera could be achieved, the problem of specific identification would possibly be less imposing. Group limits, however, are so obscure and the number of species so great, that only partial success has been realized up to this

[1] See references to biology in the bibliography of the following species: *A. carlini, erythrogaster, gardineri, helianthi, imitatrix, milwaukeensis, placida, vicina* and *wilkella.*

22(19). Abdominal terga with shallow but rather coarse punctures, surface very densely tessellate; wings fuliginous
rudbeckiae Robertson (p. 149)
Surface of abdominal terga somewhat shining, punctures minute or very fine
23

23. Tibial scopa rather thin, hairs short-plumose; mid basitarsi rather narrow; clypeus strongly protuberant, punctures quite deep and distinct, even toward upper margin, surface shining; process of labrum large, deeply emarginate apically
angusi Viereck (p. 139)
Tibial scopa dense, plumosities of hairs more elongate; clypeus not strongly convex, punctures fine, shallow and quite sparse, apical margin narrowly subrugose, surface dull and tessellate; process of labrum either very small or only shallowly emarginate
24

24. Smaller (9 mm.); process of labrum small, deeply incised apically
solidaginis Robertson (p. 151)
Larger (13 mm.); process of labrum more robust, broader at base, the narrowed apex shallowly emarginate
asteris Robertson (p. 139)

25(18). Process of labrum entire
26
Process of labrum distinctly and usually rather deeply emarginate
32

26. Clypeus evenly convex, shining, largely impunctate, with only a few scattered punctures at extreme sides
102
Clypeus either dull and tessellate or with deep distinct punctures except possibly in mid line
27

27. Dorsum of thorax and abdominal terga greenish
polemonii Robertson (p. 157)
Thorax and abdomen entirely black, without greenish reflections
28

28. Clypeus dull and densely tessellate, becoming subrugose toward apical margin laterally
29
Clypeus deeply and distinctly punctate, more or less shining
30

29. Scutum and scutellum somewhat shining, with scattered, sparse and fine but distinct punctures
simplex Smith (p. 151)
Scutum and scutellum dull, densely granular, with punctures at all evident only toward anterior margin of scutum
krigiana Robertson (p. 156)

30(28). Dorsum of thorax densely covered with bright fulvous pubescence hiding the surface; median area of clypeus flattened, shining, nearly impunctate, becoming closely punctate laterally; pleura coarsely punctate
duplicata new species (p. 144)
Dorsum of thorax with ochraceous pubescence; clypeus very broad and rather flat, dull toward base, becoming shining apically between the deep, distinct punctures; pleura densely tessellate and impunctate
31

31. Abdominal terga shining, punctures exceedingly minute, widely separated, evenly distributed; propodeal triangle dull, tessellate or very finely roughened
distans Provancher (p. 154)
Abdominal terga rather finely, but deeply and distinctly punctate; propodeal triangle with a few rather coarse striations
erigeniae Robertson (p. 155)

32(25). Abdominal terga uniformaly, coarsely, deeply and quite closely punctate, interspaces only slightly greater than diameter of punctures
33
Abdominal terga impunctate, or more sparsely and finely punctate, interspaces much exceeding diameter of the fine punctures
34

33. Apical margins of abdominal terga broadly yellowish-hyaline, entirely impunctate
gardeneri Cockerell (p. 146)
Apical margins of abdominal terga ferruginous, with a very narrow, yellowish rim, closely punctate
lauracea Robertson (p. 148)

34(32). Abdominal terga very densely tessellate and dull, without evident punctures
fulvipennis Smith (p. 145)
Abdominal terga finely tessellate, somewhat shining, with fine but distinct punctures
35

35. Larger (11 mm.); punctures of abdominal terga 2 & 3 relatively deep and distinct, interspaces only 2 or 3 times diameter of punctures; pubescence of thorax copious and elongate; triangle of propodeum finely rugose toward base
asteroides new species (p. 140)
Smaller (10 mm.); punctures of terga 2 & 3 exceedingly minute and obscure; thoracic pubescence yellowish-white, short and rather thin; triangle of propodeum tessellate, not at all rugose
solidaginis Robertson (p. 151)

36(13). Dorsal triangle of propodeum coarsely rugose or striate
37
Dorsal triangle of propodeum either tessellate or only subrugose or granular
71

37. Facial foveae much constricted below, that part being half or less as wide as upper portion
38
Facial foveae not much constricted below, and if at all so, only gradually narrowed to about half the width of the upper portion
56

38. Scutum nearly impunctate, with only a few widely scattered punctures
nuda Robertson (p. 192)
Punctures of scutum close or crowded
39

39. Constricted portion of facial foveae very widely separated from margin of eye; punctures of scutum coarse, deep and closely crowded
rugosa Robertson (p. 198)
Lower part of foveae not so widely separated from eye; scutum with distinctly separated punctures
40

40. Apical impressed area of tergum 2 occupying fully two-thirds of its median length
41
Impressed area of tergum 2 not so extensive
44

41. Front below ocelli, closely, deeply and rather coarsely punctate
miranda Smith (p. 190)
Front below ocelli shining, punctures very fine and well separated
42

42. Constricted portion of facial foveae separated from eye margin by a somewhat wider space
heraclei Robertson (p. 184)
Space separating constricted part of foveae from eye not exceeding this part in width
43

43. Basal abdominal tergum polished, nearly impunctate; apical impressed area of tergum 3 only slightly exceeding the basal area in median length, this basal part not strongly elevated
spiraeana Robertson (p. 202)
Basal tergum shining, punctures minute, sparse and irregular, but distinct; apical impressed area of tergum 3 fully twice the basal area in median length, the basal part strongly elevated
montanis new species (p. 191)

44(40). Lateral ocelli separated from margin of vertex by a space much greater than their diameter
45
Ocelli separated from margin of vertex by a space subequal to or only slightly exceeding the diameter of the ocelli
51

45. Scutum sparsely punctate, even anteriorly, interspaces several times diameter of punctures
obscura Robertson (p. 193)
Scutum more closely punctate, at least over anterior half
46

46. Pubescence of scutum very short, subappressed, conspicuously plumose and scale-like, quite dense along lateral margins
quintilis Robertson (p. 195)
Pubescence of scutum more elongate and erect, not at all scale-like and not conspicuously plumose
47

47. Anterior half of scutellum sparsely punctate, interspaces much exceeding diameter of punctures
sigmundi Cockerell (p. 200)
Scutellum closely punctate throughout
48

48. Basal abdominal tergum closely, deeply and quite coarsely punctate throughout; lower half of facial fovea no wider than space separating it from margin of eye
ceanothi Viereck (p. 179)
Basal tergum shining, very minutely and quite sparsely punctate
49

49. Abdominal tergum 2 closely and deeply punctate, interspaces about equal to diameter of punctures
virginiana new species (p. 203)
Punctures of tergum 2 very fine, interspaces much wider than diameter of punctures
50

50. Constricted lower part of facial fovea no wider than space separating it from margin of eye, except possibly at extreme tip
spiraeana Robertson (p. 202)
Constricted part of fovea not so narrow nor so widely separated from eye
votula new species (p. 204)

51(44). Impressed apical area of tergum 2 occupying slightly less than half the median length of disc
52
Impressed area of tergum 2 occupying fully half median length of disc
53

52. Punctures of abdominal terga 1 and 2 close, deep and quite coarse, interspaces not exceeding their diameter
forbesii Robertson (p. 183)
Punctures of terga 1 and 2 fine and rather sparse, interspaces several times diameter of punctures
arenakensis new species (p. 177)

53(51). Basal abdominal tergum shining, punctures minute, irregular and sparse over most of disc
hippotes Robertson (p. 184)
Basal tergum shining or not, punctures deep and distinct, although fine, quite close and evenly distributed
54

86. Facial foveae narrow, occupying only about half of space between eyes and ocelli 87
Facial foveae broad, upper end occupying most of space between eyes and ocelli 90

87. Face much longer than distance between eyes; clypeus polished and sparsely punctate *bradleyi* Viereck (p. 226)
Face about as long as broad; clypeus relatively dull and closely punctate 88

88. Clypeus somewhat shining, with a distinct median impunctate line 89
Clypeus dull and tessellate, the shallow punctures more scattered and sparse near midline, but without a distinct impunctate line; abdominal terga 2-4 with thin, white, apical fasciae *algida* Smith (p. 218)

89. Abdominal terga 2-4 with conspicuous, yellowish, apical fasciae; propodeal triangle smooth, lacking any basal striations *chromotricha* Cockerell (p. 172)
Abdominal fasciae lacking; propodeal triangle finely rugose *bisignata* new species (p. 122)

90(86). Head with at least a few black hairs along inner orbits 91
Pubescence of head and thorax entirely pale 92

91. Most of head, and thorax laterally and beneath, black pubescent *clarkella* Kirby (p. 104)
Pleura and middle of face covered with copious pale pubescence *frigida* Smith (p. 105)

92(90). Length of malar space fully one-third basal width of mandible 93
Malar space short, about one-fourth basal width of mandible 94

93. Mandibles more elongate, tips extending beyond the lateral limits of the clypeal margin when closed; process of labrum subtriangular *carolina* Viereck (p. 228)
Mandibles shorter, tips not extending beyond lateral limits of clypeal margin; process of labrum short, much broader than long *rufosignata* Cockerell (p. 230)

94(92). Scutum densely tessellate and entirely impunctate; tomentum of facial foveae brownish or fuscous at certain angles 95
Scutum dull, but with distinct and rather close punctures; tomentum of foveae pale ochraceous or whitish 97

95. Clypeus nearly impunctate, with only a very *few*, widely scattered, minute punctures toward lateral angles *seavillensis* new species (p. 217)
Clypeus deeply and rather coarsely punctate, with a median impunctate line 96

96. Wings hyaline *mandibularis* Robertson (p. 106)
Wings brownish *banksi* Malloch (p. 254)

97(94). Cheeks dull and tessellate, only slightly broader than eyes; process of labrum very large, occupying nearly entire width and length of labrum; segments 2 and 3 of flagellum hardly as long as their breadth *albisigna* Viereck (p. 211)
Cheeks shining, very finely punctate; process of labrum smaller; segment 2 of flagellum fully as long as broad, segment 3 longer *thaspii* Graenicher (p. 108)

98(85). Median third of clypeus with few if any punctures 99
Median area of clypeus distinctly punctate although possibly with a median impunctate line 103

99. Cheeks considerably broader than eyes, subcarinate posteriorly; pleura slightly protuberant below *integra* Smith (p. 232)
Cheeks little if any broader than eyes; pleura rounded below, not at all protuberant 100

100. Abdominal terga 1 and 2 shining, with very fine but distinct punctures, these evenly distributed and rather close on tergum 2 *robertsonii* Dalla Torre (p. 237)
Abdominal terga dull and tessellate, either impunctate or with exceedingly minute, barely distinguishable, sparse punctures 101

101. Propodeal triangle coarsely granular; median area of clypeus dull, with a few scattered fine punctures; process of labrum short, broadly truncate *dreisbachi* new species (p. 230)
Propodeal triangle smooth, finely tessellate, with a basal fringe of very short striations; clypeus shining and impunctate over median third; process of labrum rounded 102

102(26). Dorsum of thorax with whitish or ochraceous pubescence, the metathoracic tuft rather inconspicuous *miserabilis bipunctata* Cresson (p. 159)

Dorsum of thorax with bright fulvous pubescence, and with a dense tuft of elongate hairs on metanotum *miserabilis scutellata* Dalla Torre (p. 160)

103(98). Abdomen punctate to at least some slight degree, the punctures sometimes being very minute and obscure 104
Abdomen entirely impunctate 119

104. Cheeks considerably broader than eyes (ratio of about 3:2) 105
Cheeks only very slightly broader than eyes, if at all 111

105. Pleura strongly, angulately protuberant below *persimulata* Viereck (p. 235)
Pleura rounded below, not at all protuberant 106

106. Process of labrum nearly as long as its basal width, subtriangular, with truncate apex 107
Process of labrum much broader than its median length 108

107. Scutellum polished, nearly impunctate, with only a few scattered punctures near midline *platyparia* Robertson (p. 236)
Scutellum rather dull, with shallow but distinct, rather sparse punctures, becoming rather close laterally *placida* Smith (p. 214)

108(106). Abdominal terga bluish, shining, punctures minute and rather uniformly sparse *geranii* Robertson (p. 221)
Abdominal terga black, possibly reddened apically 109

109. Clypeus rather flat, dull and tessellate, the punctures shallow but close and distinct, separated by little more than a puncture width *erythrogastertd subaustralis* Cockerell (p. 116)
Clypeus strongly convex and protuberant, punctures quite coarse and deep, close laterally but becoming rather widely separated above median line 110

110. Hind tibiae cuneate, the apex nearly twice the width of the basitarsi; facial fovese broad, occupying most of space between eyes and ocelli *chippewaensis* new species (p. 212)
Hind tibiae slender and elongate, not broadened apically; facial foveae narrower, occupying only slightly more than half of space between eyes and ocelli *seviensis* new species (p. 132)

111(104). Punctures of abdominal terga close, coarse and deep, interspaces not much exceeding their diameter 112
Abdominal punctures minute, interspaces very much greater than their diameter 113

112. Process of labrum very short, three or four times broader than long *cressonii* Robertson (p. 248)
Process of labrum large and conspicuous, about half as long as it is broad *violae* Robertson (p. 252)

113(111). Facial foveae broad, occupying at upper end two thirds or more of space between eyes and ocelli 114
Facial foveae relatively narrow, occupying little more than half of space between eyes and ocelli 117

114. Smaller (7 mm.); clypeus shining, with a few very sparse, scattered, irregular punctures *sixiaeformis* Cockerell (p. 169)
Larger (9 mm.); clypeus closely punctate laterally, with a more or less definite median impunctate line 115

115. Smaller (length 9-10 mm., breadth of abdomen, 3 mm.); clypeus usually with a distinct median impunctate line 116
Larger (length 11 mm., breadth of abdomen 4 mm.); clypeus uniformly punctate, without a distinct median impunctate line *macoupinensis* Robertson (p. 106)

116. Hind tibiae slender, about as broad at center as at apex, and this not much wider than basitarsi; foveae narrower, occupying about two-thirds of space between eyes and ocelli *miserabilis miserabilis* Cresson (p. 160)
Hind tibiae gradually broadening to the apex, which is about twice the width of the basitarsi; foveae broad, occupying most of space between eyes and ocelli *wheeleri* Graenicher (p. 246)

117(113). Median area of clypeus flattened, punctures deep and distinct, uniformly rather sparse, interspaces being several times diameter of punctures *arabis* Robertson (p. 251)
Clypeus broadly convex, more closely punctate laterally than along midline 118

118. Clypeus more protuberant and shining; hind tibiae slender, not much broader at apex than their basitarsi *novae-angliae* Viereck (p. 224)
Clypeus relatively dull, less protuberant; hind tibiae broader at apex than in center, and considerably broader than their basitarsi *phaceliae* new species (p. 224)

8. Basal segment of flagellum slightly shorter than 2nd segment ..... *personata* Robertson (p. 165)

Basal segment of flagellum longer than segment 2, often equalling or exceeding segments 2 and 3 combined 9

9. Clypeus very broad and flat, nearly twice as broad as the median length 10

Clypeus less broad and flat, median length exceeding half the breadth; flagellar segments 2 and 3 no more than equalling the 1st 11

10. Eyes parallel; process of labrum narrowly truncate; lateral facial maculae terminated about at level of upper margin of clypeus ..... *cressonii cressonii* Robertson (p. 248)

Eyes slightly divergent below; process of labrum short and very broad; lateral facial maculae terminated about at level of antennae ..... *cressonii tallahasensis* new subspecies (p. 249)

11(9). Lateral face marks large, extending to level of antennae ..... *accepta* Viereck (p. 137)

Lateral face marks small, not nearly attaining level of upper margin of clypeus 12

12. Abdominal terga smooth but dull, with scattered, sparse and minute punctures; abdominal fasciae rather loose and thin, widely interrupted medially on segments 1 and 2 ..... *asteris* Robertson (p. 139)

Abdominal terga densely pebbled and entirely impunctate, fasciae dense and complete on segments 2-5, somewhat interrupted medially on 1 ..... *fulvipennis* Smith (p. 145)

13(6). Basal segment of flagellum somewhat shorter than segment 2 14

Basal segment of flagellum at least equal in length to segment 2 15

14. Mandibles short, apex of one not nearly attaining base of the other; cheeks rounded, subequal to eyes in width ..... *neonana* Viereck (p. 163)

Mandibles elongate, apex of one nearly attaining base of the other when closed; cheeks broad and flat, conspicuously angulate ..... *bankxi* Malloch (p. 254)

15(13). Lower angle of cheek strongly produced to form a conspicuous, ventral, elongate lobe ..... *cerebrata* new species (p. 256)

Lower angle of cheek not produced .. 16

16. Basal segment of flagellum considerably shorter than segments 2 and 3 combined 17

Basal segment of flagellum nearly or quite equal to segments 2 and 3 combined 22

17. Cheeks much broader than eyes, with a rounded angle opposite middle of eye 18

Cheeks rounded posteriorly, not much broader than eyes, if any 19

18. Scutellum with a dense tuft of erect, elongate, fulvous hairs ..... *miserabilis scutellata* Dalla Torre (p. 160)

Pubescence of scutellum relatively thin, short and pale ..... *miserabilis bipunctata* Cresson (p. 159)

19(17). Length of clypeus nearly equal to its breadth, punctures deep and rather coarse ..... *duplicata* new species (p. 144)

Clypeus considerably broader than long, punctures minute 20

20. Process of labrum broad and very short, not emarginate ..... *robertsonii* Dalla Torre (p. 237)

Process of labrum more elongate and in some degree emarginate 21

21. Basal segment of flagellum no more than equal in length to 2nd segment ..... *asteroides* new species (p. 140)

Basal segment of flagellum considerably longer than 2nd segment ..... *placata* new species (p. 148)

22(16). Lateral angles of sternum 6 strongly reflexed 23

Lateral angles of sternum 6 not reflexed 25

23. Abdominal terga rather dull, with only widely spaced and very obscure and minute punctures 24

Abdominal terga to some degree shining, with deep and distinct, although fine punctures ..... *gardineri* Cockerell (p. 146)

24. Median segments of flagellum about as broad as long; space between margin of vertex and lateral ocelli somewhat greater than their diameter ..... *solidaginis* Robertson (p. 151)

Median segments of flagellum longer than broad; space between margin of vertex and lateral ocelli no greater than their diameter ..... *brassicae* new species (p. 142)

25(22). Cheeks broad, somewhat angulate opposite middle of eye; mandible with a triangular, basal, inferior dilation ..... *ziziaeformis* Cockerell (p. 169)

Cheeks not at all angulate, if broad; mandibles simple at base 26

26. Space between margin of vertex and lateral ocelli equal to no more than diameter of the ocelli 27

Space between margin of vertex and lateral ocelli distinctly greater than diameter of ocelli 30

27. Lateral and upper margins of clypeus dark; segments 2-4 of flagellum very short, their combined length not much exceeding the basal segment ..... *krigiana* Robertson (p. 156)

Clypeus entirely yellow; at least 4th segment of flagellum fully as long as broad 28

28. Small (5-6 mm.); abdominal terga smooth and shining; 1st transverse cubitus meeting marginal cell very close to stigma ..... *ziziae* Robertson (p. 168)

Larger (8 mm.); abdominal terga dull, tessellate or pebbled; 1st transverse cubitus rather widely separated from stigma 29

29. Wings deep brownish, with violaceous reflections; abdominal terga densely pebbled, with entire, dense, bright ochraceous, apical fasciae ..... *fulvipennis* Smith (p. 145)

Wings subhyaline; abdominal terga finely tessellate, with scattered minute and obscure punctures, the fasciae of loose, elongate, whitish hairs ..... *arabis* Robertson (p. 251)

30(26). Second and 3rd submarginal cells subequal in length; abdomen impunctate, dull and tessellate ..... *bracecata* Viereck (p. 141)

Third submarginal cell exceeding 2nd in length; abdomen to some degree punctate 31

31. Apical margins of abdominal terga narrowly and deeply depressed, testaceous, discs otherwise closely punctate, dull and densely tessellate between punctures ..... *rudbeckiae* Robertson (p. 149)

Apical margins of terga more broadly and shallowly depressed, discs rather smooth, tessellate, very finely and sparsely punctate 32

32. Thorax with dense ochraceous pubescence; apical margins of abdominal terga broadly yellowish-hyaline ..... *helianthi* Robertson (p. 147)

Thorax with rather thin, greyish-white pubescence; apical margins of terga only very narrowly and inconspicuously hyaline ..... *aliciae* Robertson (p. 138)

33(1). Posterior margin of cheeks sharply and conspicuously carinate 34

Cheeks at most with a posterior angle, often broadly rounded, at most, subcarinate 38

34. Largely covered with long, erect and quite dense, yellow pubescence, this forming broad, entire, but rather loose apical fasciae on abdominal terga ..... *hirticincta* Provancher (p. 173)

Pubescence relatively short, thin and inconspicuous, more whitish; abdominal fasciae poorly developed 35

35. Triangle of propodeum smooth, with at most some very short and fine striations along basal margin 36

Triangle of propodeum completely and quite coarsely rugose or rugoso-striate 37

36. Scutum with some admixture of black or fuscous pubescence; abdominal terga somewhat shining, with very fine but distinct punctures ..... *peckhami* Cockerell (p. 234)

Pubescence of scutum entirely pale; abdominal terga dull, tessellate, without visible punctures ..... *integra* Smith (p. 232)

37(35). Cheeks smooth and shining, posterior carina sharp and distinct to lower angle opposite lower end of eye, about parallel to margin of eye ..... *fragilis* Smith (p. 231)

Cheeks dull and tessellate, posterior carina distinct only at upper end, hind margin divergent from eye margin, with a rounded angle opposite lower third of eye ..... *persimulata* Viereck (p. 235)

38(33). Mandible with a distinct basal inferior angle or tooth 39

Mandible lacking the basal angle or tooth 43

39. Face with black hairs along inner orbits and around antennae ..... *milwaukeensis* Graenicher (p. 107)

Pubescence of face entirely pale 40

40. Malar space very short, almost linear 41

Malar space longer, the length being equal to about one-third the basal width of the mandible 42

76. Abdomen more or less suffused with red ..... *mariae mariae* Robertson (p. 187)

Abdomen entirely black ..... *mariae concolor* Robertson (p. 188)

77(75). Punctures of vertex rather coarse and distinct, interspaces to some degree shining 78

Vertex dull and tessellate, punctures obscure 80

78. Segment 2 of flagellum little if any longer than segment 1; scutellum coarsely and closely punctate ..... *miranda* Smith (p. 190)

Segment 2 of flagellum much longer than segment 1 79

79. Abdominal terga shining, punctures very fine, those on basal tergum minute, well separated ..... *rehni* Viereck (p. 196)

Abdomen somewhat less shining, punctures deep and distinct, interspaces not much more than twice the diameter of punctures, at most ..... *ceanothi* Viereck (p. 179)

80(77). Basal abdominal tergum shining, punctures exceedingly minute, barely visible if at all; segment 2 of flagellum nearly twice length of segment 1 81

Basal tergum less shining, punctures deep and distinct, although fine; segment 2 of flagellum only slightly longer than segment 1 82

81. Smaller (7-8 mm.); sternum 7 only slightly produced medially, not emarginate ..... *spiraeana* Robertson (p. 202)

Larger (8-9 mm.); sternum 7 strongly produced, this portion broadly, triangularly emarginate ..... *timia* new species (p. 203)

82(80). Punctures of clypeus rather fine and crowded, especially over upper half 83

Clypeal punctures rather coarse, uniformly although not widely separated ..... *sigmundi* Cockerell (p. 200)

83. Abdominal terga shining, punctures somewhat finer and closer; hind tibiae and all tarsi testaceous ..... *hippotes* Robertson (p. 184)

Abdominal terga rather dull, punctures more widely separated; legs entirely dark ..... *fenningeri* Viereck (p. 182)

84(62). Basal segment of flagellum equalling 2 and 3 combined, these quite short, no longer than broad 85

Second and 3rd segments of flagellum combined usually longer than basal segment, at least the 3rd longer than broad 88

85. Larger (9 mm.); clypeus strongly convex, protuberant; ocelli separated from margin of vertex by about twice their diameter ..... *violae* Robertson (p. 252)

Smaller (7 mm. or less); clypeus not markedly protuberant; space between margin of vertex and lateral ocelli no greater than their diameter 86

86. Abdomen entirely impunctate; propodeal triangle well defined, finely reticulate ..... *fragariana* Graenicher (p. 161)

Abdomen finely but distinctly punctate; propodeal triangle poorly defined, very short, with a basal fringe of short striae 87

87. Clypeus strongly protuberant, projecting fully one-half below suborbital line; segment 3 of flagellum fully as long as broad ..... *crenata* new species (p. 221)

Clypeus moderately convex, projecting but very little below suborbital line; segment 3 of flagellum much broader than long ..... *porterkrigiana* new species (p. 157)

88(84). Diameter of lateral ocelli fully equal to space separating them from margin of vertex 89

Lateral ocelli separated from margin of vertex by a space greater than their diameter 100

89. Face, including clypeus, with much long blackish pubescence ..... *algida* Smith (p. 218)

Face usually entirely pale pubescent, but if any dark hairs present, limited to inner orbits or upper portion of head 90

90. Second segment of flagellum equal to 1st in length 91

Basal segment of flagellum considerably longer than 2nd 92

91. Slightly smaller (6.5 mm.); gonocoxal lobes moderately reproduced; 1st recurrent vein reaching 2nd submarginal cell at middle or toward apex ..... *nasoni* Robertson (p. 244)

Larger (7.5 mm.); gonocoxal lobes not produced; 1st recurrent vein reaching 2nd submarginal cell nearer to base than to apex ..... *wheeleri* Graenicher (p. 246)

92(90). Basal segment of flagellum fully twice the length of 2nd 93

Basal segment of flagellum only slightly exceeding 2nd in length 95

93. Clypeus protuberant; dorsal area of propodeum rather narrow; gonostyli slightly expanded apically ..... *polemonii* Robertson (p. 157)

Clypeus relatively flat; dorsal area of propodeum quite broad; gonostyli very slender and spine-like apically 94

94. Sixth ventral segment of abdomen reflexed, with a short, dense median tuft of hairs, and on each side a longer and quite dense tuft of straight hairs ..... *illinoiensis* Robertson (p. 161)

Abdominal sternum 6 simple, not of the above form ..... *salictaria* Robertson (p. 167)

95(92). Very small (5-6 mm.); median segments of flagellum no longer than broad ..... *fragariana* Graenicher (p. 161)

Larger (8 mm. or more); median segments of flagellum considerably longer than broad 96

96. Process of labrum narrow, entire, length nearly equal to breadth ..... *placida* Smith (p. 214)

Process of labrum short, much broader than long 97

97. Abdominal terga finely but distinctly punctate; clypeus protuberant; gonocoxites slender apically 98

Abdominal terga impunctate or with extremely minute, obscure punctures, clypeus broadly convex; gonocoxites to some degree expanded apically 99

98. Cheeks slightly broader than eyes; clypeus shining, with coarse, deep and rather sparse punctures ..... *geranii* Robertson (p. 221)

Cheeks subequal to eyes in width; clypeus dull and tessellate, punctures shallow and obscure ..... *phaceliae* new species (p. 224)

99(97). Abdominal terga with a faint greenish tinge; apical produced portion of sternum 8 parallel-sided; gonocoxal lobes only slightly produced ..... *lata* Viereck (p. 222)

Abdominal terga dull black; apical portion of sternum 8 more gradually narrowed to a slender tip; gonocoxal lobes strongly produced ..... *bisalicis* Viereck (p. 219)

100(88). Segment 2 of flagellum considerably longer than the basal segment; abdomen dull, tessellate between the fine and rather close punctures; cheeks and eyes subequal in width ..... *wilkella* Kirby (p. 250)

Segments 1 and 2 of flagellum subequal in length, or 1st segment longer 101

101. Space separating lateral ocelli from margin of vertex relatively narrow, less than twice the diameter of ocelli 102

Lateral ocelli separated from margin of vertex by a space fully equal to twice their diameter 104

102. Abdomen entirely impunctate ..... *confederata* Viereck (p. 125)

Abdomen with distinct, although possibly minute punctures 103

103. First and 2nd flagellar segments equal in length; abdominal punctures coarse, deep and close ..... *cressonii ivanensis* new subspecies (p. 249)

Basal segment of flagellum considerably exceeding 2nd segment in length; abdominal punctures minute and sparse ..... *dunningi* Cockerell (p. 113)

104(101). Face with conspicuous black pubescence along inner margins of eyes 105

Pubescence of face entirely pale 106

105. Abdomen black ..... *carlini carlini* Cockerell (p. 111)

Abdomen ferruginous ..... *carlini neorhodura* new subspecies (p. 113)

106(104). Sternum 6 with a pronounced apical tuft of elongate hairs, each hair being nearly as long as the median length of the plate ..... *pruni* Robertson (p. 117)

Apical hairs on sternum 6 of ordinary length, not nearly as long as the plate 107

107. Tip of sternum 8 sharply acute on each side of a deep median emargination ..... *nivalis* Smith (p. 128)

Tip of sternum 8 blunt, truncate or with a very shallow and indefinite median notch 108

108. Relatively large (12 mm. or more); pubescence of head and thorax fulvous; wings deep fuliginous; legs bright ferruginous; dorsal triangle of propodeum rather coarsely rugose ..... *obscuripennis* Smith (p. 129)