

ABSTRACT

*The Monotypic North American  
Subgenus Larandrena of Andrena  
(Hymenoptera: Apoidea)*

D. W. RIBBLE

*Larandrena* contains a single species, *A. miserabilis* Cresson. This small, common *Andrena* is found throughout most of the United States and southern Canada in the spring. The subgeneric position, nomenclature, redescription, variation, notes on the biology, parasites, range, seasonal activity and plant host records are included. *A. miserabilis* is thought to be an important pollinator of fruit trees.

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INTRODUCTION

LaBerge (1964) erected this subgenus of *Andrena* for the unique species *miserabilis*. Previously *miserabilis* had been considered a *Micrandrena* (sometimes provisionally) because of its small size and rather large stigma. *A. miserabilis* has at times been assigned to the subgenera *Opandrena*, *Ptilandrena* and *Andrena* (*s. str.*). *Larandrena* belongs to a group of subgenera possessing humeral angles on the pronotum which is only distantly related to *Micrandrena*. *Larandrena* is perhaps most closely related to *Andrena* (*s. str.*); however, *Andrena* and related subgenera are in need of revision.

All papers known to refer to *A. miserabilis* are listed in the synonymy. An abbreviation after each citation indicates the main emphasis of the paper as it pertains to *miserabilis*. "Taxonomic" is abbreviated "tax." and if there is a description of the female or male, the symbols ♀ or ♂ are used. Other abbreviations are: biol. = biology, fl. = flower record, cat. = catalog, and rec. = locality record. Tergum 1 refers to the first metasomal tergum, and the other terga and sterna are numbered accordingly.

Subgenus *Larandrena* LaBerge

*Larandrena* LaBerge, 1964, Bull. Univ. Nebr. State Mus.; 4:285, 289, 304-305 (♀, ♂, key) (as a subgenus of *Andrena*).

Type species: *Andrena miserabilis* Cresson, 1872, monobasic and by original designation.

A complete description of this subgenus is given in LaBerge (1964, pp. 304-305). *Larandrena* can be differentiated from other subgenera of *Andrena* by the very shiny, broad, impunctate area

<sup>1</sup> Graduate Student, Department of Entomology, University of Nebraska, Lincoln, Nebraska 68503.

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on the central portion of the clypeus (this character approaches the narrow condition found in some *Parandrena* females). The male also has a yellow clypeus which bears two black spots [a few *Andrena* (*s. str.*) possess yellow clypei but these species are different in other respects and may eventually be reassigned]. Both sexes possess humeral angles on the pronotum (more noticeable in the males) and rather large stigmata. There are three submarginal cells on the forewing (*Parandrena* has two submarginal cells). The legs of the female are slender and the long tibial scopal hairs bear a few simple branches. These are small bees. *A. miserabilis*, the only species placed in *Larandrena*, is described below.

*Andrena* (*Larandrena*) *miserabilis* Cresson

- Andrena clypeata* Smith, 1853, Cat. Hym. Ins. Coll. Brit. Mus., pt. 1:115 ( $\delta$ ) (*non Andrena clypeata* Brullé, 1832); Cresson, 1863, Proc. Ent. Soc. Phila., 1:334 (cat.); Cresson, 1887, Trans. Amer. Ent. Soc., suppl. vol., p. 293 (cat.); Provancher, 1889, Add. Corr. Faune Hym. Prov. Qué., pp. 305, 310 ( $\delta$ ,  $\varphi$ , key); Morice and Cockerell, 1901, Canad. Ent., 33:124 (type); Cockerell, 1906, Psyche, 13:35 (type).
- Andrena miserabilis* Cresson, 1872, Trans. Amer. Ent. Soc., 4:259 ( $\varphi$ ,  $\delta$ ); Cresson, 1887, Trans. Amer. Ent. Soc., suppl. vol., p. 294 (cat.); Provancher, 1889, Add. Corr. Hym. Prov. Qué., pp. 306, 311-312 ( $\varphi$ ,  $\delta$ , key); Cockerell, 1897, Entomologist, 30:307 (tax.); Birkman, 1899, Ent. News, 10:244 (rec.) (as *miserabilis*?); Bruner, 1903, Trans. Amer. Ent. Soc., 29:248?, 249 (key); J. Smith, 1910, Ann. Rept. New Jersey State Mus. . . . 1909, p. 690 (rec.); Viereck and Cockerell, 1914, Proc. U. S. Nat. Mus., 48:22 (tax.); Cresson, 1916, Mem. Amer. Ent. Soc., 1:108 (type); Brimley, 1938, Ins. North Carolina . . . , p. 453 (rec.).
- Andrena bipunctata* Cresson, 1872, Trans. Amer. Ent. Soc., 4:259 ( $\delta$ ); Cresson, 1887, Trans. Amer. Ent. Soc., suppl. vol., p. 293 (cat.); Robertson, 1896, Bot. Gaz., 22:156, 158, 163 (fl.); Robertson, 1897, Trans. Acad. Sci. St. Louis, 7:332, 335 (tax.); Cockerell, 1897, Entomologist, 30:306 (tax.); Cockerell, 1898, Canad. Ent., 30:104 (rec.); Robertson, 1898, Bot. Gaz., 25:233, 237 (fl.); Bridwell, 1899, Trans. Kans. Acad. Sci., 16:210 (rec.); Robertson, 1900, Trans. Acad. Sci. St. Louis, 10:49, 50 (tax.); Morice and Cockerell, 1901, Canad. Ent., 33:152 (tax.); Cockerell, 1901, Jour. New York Ent. Soc., 9:133 ( $\delta$ ,  $\varphi$ ); Cockerell, 1902, Ann. Mag. Nat. Hist., (7) 9:103 (rec.); Bruner, 1903, Trans. Amer. Ent. Soc., 29:240, 244, 256, 258 (key); Graenicher, 1905, Trans. Wisc. Acad. Sci. . . . , 15:91 (fl.); Cockerell, 1906, Psyche, 13:9, 35 (tax.);

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Pierce, 1911, Proc. U. S. Nat. Mus., 40:493 (parasite); Pierce, 1911, Genera Insectorum, 121:4 (parasite); Cockerell, 1914, Ann. Mag. Nat. Hist., (8)14:11 (key); Cresson, 1916, Mem. Amer. Ent. Soc., 1:107 (type); Pierce, 1918, Proc. U. S. Nat. Mus., 54:441, 443 (parasite); Salt, 1927, Jour. Expt. Zool., 48:230, 280 (parasite); Atwood, 1934, Canad. Jour. Res., 10:208, 209, figs. 41, 73 (key); Brittain and Newton, 1934, Canad. Jour. Res., 10:257, 261 (fl.); Procter, 1938 (republished, 1946), Biol. Surv. Mt. Desert Region . . . , p. 441 (rec.); R. Bohart, 1941, Univ. Calif. Publ. Ent., 7:131 (parasite); Timberlake, 1951, Proc. U. S. Nat. Mus., 101:380 (tax); Michener and Rettenmeyer, 1956, Univ. Kans. Sci. Bull., 37:646, 670, 679-681 (biol.).

*Andrena flavoclypeata* Smith, 1879, Descr. New Species Hym. Coll. Brit. Mus. . . , p. 54 (♂); Cresson, 1887, Trans. Amer. Ent. Soc., suppl. vol., p. 293 (cat.); Robertson, 1891, Trans. Amer. Ent. Soc., 18: 50, 55 (key, fl.); Robertson, 1892, Bot. Gaz., 17:174 (fl.); Robertson, 1893, Trans. Amer. Ent. Soc., 20:148, 149 (tax.); Robertson, 1893, Bot. Gaz., 18:51, 267 (fl.); Robertson, 1894, Trans. Acad. Sci. St. Louis, 6:436, 444, 445, 447 (fl.); Robertson, 1894, Bot. Gaz., 19:107, 110 (fl.); Cockerell, 1895, Psyche, 7 (sup., 1):5 (tax.); Robertson, 1896, Bot. Gaz., 21:76, 77 (fl.); Robertson, 1896, Trans. Acad. Sci. St. Louis, 7:154, 168 (fl.); J. Smith, 1900, Ins. New Jersey, p. 510 (rec.); Morice and Cockerell, 1901, Canad. Ent., 33:152 (type); Cockerell, 1906, Psyche, 13:9 (type); Viereck, 1907, Ent. News, 18:282, 284, 286, 287 (key); Cockerell, 1909, Proc. U. S. Nat. Mus., 36:420 (tax.); J. Smith, 1910, Ann. Rept. New Jersey State Mus. . . . 1909, p. 689 (rec.); Pierce, 1911, Proc. U. S. Nat. Mus., 40:493 (parasite); Cockerell, 1916, Canad. Ent., 48:272 (tax.); Britton, 1920, Check-list Ins. Conn., p. 343 (rec.); Viereck, 1928, Cornell Univ. Agric. Expt. Sta. Mem., 101:1023 (rec.); Hendrickson, 1930, Iowa State Coll. Jour. Sci., 4:163 (rec.); Cockerell, 1930, Ann. Mag. Nat. Hist., (10)5:115 (tax.); Cockerell, 1932, Canad. Ent., 64:158 (tax.); Brittain and Newton, 1934, Canad. Jour. Res., 10:257, 259, 261 (fl.).

*Andrena scutellaris* Robertson, 1893, Trans. Amer. Ent. Soc., 20:148-149 (♀, ♂) (*non Andrena scutellaris* Morawitz, 1880).

*Anthrena* [*sic*] *scutellata* Dalla Torre, 1896, Cat. Hym. . . . , 10:151 (n. name for *scutellaris* Robertson).

*Anthrena* [*sic*] *bipunctata*: Dalla Torre, *ibid.*, p. 107 (cat.).

*Anthrena* [*sic*] *miserabilis*: Dalla Torre, *ibid.*, p. 138 (cat.).

*Anthrena* [*sic*] *clypeolata* Dalla Torre, *ibid.*, p. 113 (n. name for *clypeata* Smith).

- Andrena scutellata*: Robertson, 1897, Trans. Acad. Sci. St. Louis, 7: 335 (tax.); Bruner, 1903, Trans. Amer. Ent. Soc., 29:240, 244, 254 (key).
- Andrena clypeolata*: Morice and Cockerell, 1901, Canad. Ent., 33:124 (tax.); Bruner, 1903, Trans. Amer. Ent. Soc., 29:240, 244 (key).
- Opandrena bipunctata*: Robertson, 1902, Trans. Amer. Ent. Soc., 28:191, 193 (key); Pierce, 1909, Bull. U. S. Nat. Mus., 66:35, 42, 91, 98, 190 (parasite); Robertson, 1910, Canad. Ent., 42:325, 326, 328 (parasite).
- Andrena pennsylvanicola* Viereck, 1907, Ent. News, 18:284, 287 (key); Viereck, 1916, Guide Ins. Conn., Pt. 3, Hym. . . . , pp. 713, 718 (key) .
- Andrena flavoclypeata miserabilis*: Pierce, 1909, Bull. U. S. Nat. Mus., 66:92, 110, 191 (parasite); Pierce, 1911, Genera Insectorum, 121:4 (parasite); Pierce, 1918, Proc. U. S. Nat. Mus., 54:442 (parasite).
- Andrena miserabilis flavoclypeata*: Viereck, 1916, Guide Ins. Conn., Pt. 3, Hym. . . . , pp. 712, 713, 715, 716 (key); Brimley, 1938, Ins. North Carolina . . . , p. 453 (rec.).
- Andrena (Andrena) miserabilis*: Viereck, 1916, Proc. Acad. Nat. Sci. Phila., 68:589 (tax.).
- Opandrena miserabilis*: Robertson, 1925, Ecol., 6:432 (fl.) (as *miserabilis*); Robertson, 1928, Flowers and Ins., pp. 24, 42, 45, 46, 97, 99, 100, 102, 103, 104, 157, 158, 160, 161, 162, 164, 165, 167, 168, 171, 172, 177, 178, 180, 181, 182, 183, 184, 185, 193, 198, 201 (fl.); Pearson, 1933, Ecol. Mono., 3:383, 395 (rec.).
- Andrena (Ptilandrena) pronitens* Cockerell, 1930, Ann. Mag. Nat. Hist., (10)5:114-115 (♀).
- Andrena (?Micrandrena) miserabilis*: Lanham, 1949, Univ. Calif. Publ. Ent., 8:209 (tax.); Krombein, 1958, Hym. Amer. North of Mex. . . . , p. 215 (tax.).
- Andrena (?Micrandrena) pennsylvanicola*: Lanham, 1949, Univ. Calif. Publ. Ent., 8:209 (tax.).
- Andrena (?Micrandrena) scutellaris*: Lanham, *loc. cit.* (tax.).
- Andrena (?Micrandrena) scutellata*: Lanham, *loc. cit.* (tax.).
- Andrena (?Micrandrena) clypeata*: Lanham, *loc. cit.* (tax.).
- Andrena (?Micrandrena) clypeolata*: Lanham, *loc. cit.* (tax.).
- Andrena (?Micrandrena) flavoclypeata*: Lanham, *loc. cit.* (tax.).
- Andrena (?Micrandrena) pronitens*: Lanham, *loc. cit.* (tax.).
- Andrena (?Micrandrena) bipunctata*: Lanham, *loc. cit.* (tax.); Linsley, 1951, in Hym. Amer. North of Mex. . . . , p. 1058 (tax.).

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*Andrena* (*Micrandrena*) *miserabilis*: Timberlake, 1951, Proc. U. S. Nat. Mus., 101:398 (tax.).

*Andrena* (?*Micrandrena*) *miserabilis scutellata*: Mitchell, 1960, Bees Eastern U. S., 1:95, 98, 160-161, 176 (tax., key).

*Andrena* (?*Micrandrena*) *miserabilis bipunctata*: Mitchell, 1960, Bees Eastern U. S., 1:94, 98, 159-160, 176, figs. 29-32 ( $\delta$ ,  $\varphi$ , key).

*Andrena* (?*Micrandrena*) *miserabilis miserabilis*: Mitchell, 1960, Bees Eastern U. S., 1:95, 160, 176, fig. 29 ( $\varphi$ ).

*Andrena* (*Larandrena*) *miserabilis*: LaBerge, 1964, Bull. Univ. Nebr. State Mus., 4:302, 304 (tax.).

*Andrena* (*Micrandrena*) *miserabilis bipunctata*: Knerer and Atwood, 1964, Proc. Ent. Soc. Ontario, 94:46-47 (rec., fl.).

Because of sexual dimorphism and morphological variation, the status of the name for this species has been confused. It has been considered under nine specific and five subspecific combinations of names. The preoccupation of two names (*clypeata* Smith and *scutellaris* Robertson) and several *lapsi* also account for some of this confusion.

Cresson (1872) described *miserabilis* ( $\varphi$ ,  $\delta$ ; top of page) and *bipunctata* ( $\delta$ ; middle of page) on the same page. This confusion concerning the sexes continued for some time; the females being known as *miserabilis* and the males as *bipunctata* or *flavoclypeata*. However, as early as 1891, Robertson understood the correct relationship since he had found the bees *in copula*. Linsley's catalog (1951) lists *miserabilis* as a junior synonym of *bipunctata*, an incorrect designation under the 1948 rules of zoological nomenclature then in effect. Timberlake (1951) correctly lists *bipunctata* as a junior synonym of *miserabilis*. However, neither of these papers nor any others seem to fulfill the rule of the first revisor in Article 24 of the 1961 International Code of Zoological Nomenclature. The synonymy and discussion given above is intended to fulfill this requirement.

*A. miserabilis* can be differentiated from other *Andrena* most easily by the characters given above under the monotypic subgenus *Larandrena*. Although 4,838 specimens were examined during this study, the following description of *miserabilis* is based on material collected two miles east of Hickman, Lancaster County, Nebraska (May 5, 1964; W. E. LaBerge). This material is from near the center of the range of *miserabilis* and is representative of the species.

FEMALE. *Measurements and ratios*: Length, 8.2 mm; width of mesothorax, 2.3 mm; wing length from tegula, 6.4 mm; facial length/width, 1.25; foveal length/width, 2.86.

*Integumental color:* Black except: tip of mandible deep red; eye grey; flagellum red-brown below and at tip; wings light amber, veins and pterostigma darker amber; tegula outer margin amber; terga with narrow amber apices; sterna with broad amber apices; distitarsi yellow-brown; tibial spurs light amber; claws amber.

*Structure:* Antenna reaching just beyond tegula; scape reaching lower edge of middle ocellus, slightly longer than flagellar segments 1-4; flageller segment 1 about as long as 2 and 3 together, tapered toward base; segment 2 slightly shorter than 3, each shorter than segment 4, both slightly tapered; middle segments about as wide as long; ultimate segment rounded in lateral view, pointed in dorsal view, half again as long as broad. Eye about three and a half times as long as broad in anterior view, inner eye margins nearly parallel. Malar space about three times as wide as long. Mandibles decussate in repose, extending to opposite corner of labrum; apex rounded; inner rounded subapical tooth present. Galea with outer margin below palpus expanded into a large lobe; both margins curving downward, tapering to a narrowly rounded apex; surface shiny, with fine reticular shagreening which form shallow, flat bottomed pits. Maxillary palpus with segments in ratio of about 1.3 : 2.1 : 1.6 : 1.6 : 1.0 : 1.6; segments tapering toward bases; segment 6 slender, flattened; segments 5 and 6 extending beyond galea. Labial palpus with segments in ratio of about 1.9 : 1.2 : 1.0 : 1.1; segments tapering towards bases; segment 1 curved; segment 4 slender, flattened; segments 3 and 4 attached subapically. Labrum about three times as wide as long, outer margin broadly rounded from side to side; process half as wide as, more than half as long as entire labrum, raised, shiny, expanded towards base, apex broadly truncated. Clypeus slightly more than half again as broad as long, protruding beyond lower margin of eye by about half width of eye in lateral view, middle third except base smooth and very shiny; rest of clypeus sculptured; punctures large, far apart, edges indistinct; surface shagreened much like galea, except pits larger. Supraclypeal area shiny, with close distinct punctures, surface with reticular shagreening. Genal area in lateral view slightly wider than eye, surface with reticular shagreening. Vertex elevated above eyes, extending past lateral ocellus by one ocellar width; surface between ocelli very rough, with irregular shagreening; punctures indistinct; surface above fovea smoother, shiny, impunctate, with reticular shagreening. Face above antennal fossae shiny, with indistinct punctures, vertical rugae, irregular shagreening. Facial fovea rounded dorsally past eye, dorsally nearly as wide as eye, inner margin tapering two-thirds distance of eye to rounded point.

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Pronotum with weak humeral angle, weak ridge extending ventrally from humeral angle, ridge interrupted by weak depressed suture, surface with reticular shagreening. Mesoscutum with indistinct punctures, surface with coarse reticular shagreening; parapsidal lines distinct. Tegula oval, with minute reticular shagreening. Scutellar surface similar to mesoscutal but more punctures, shagreening weaker; later elevated areas with few punctures, shiny. Metanotum like mesoscutum except more punctures. Propodeum with dorsal enclosure concave on anterior margin, posterior margins meeting to form a "V", enclosure sloping gently over anterior two-thirds, posterior third vertical, surface with coarse reticular shagreening, becoming rugose towards base; propodeum with posterior surface divided by deep vertical sulcus, posterior-lateral carinae extending from base of metasoma in a broad "V", posterior and dorsolateral areas on same level and surrounding enclosure, punctures indistinct, slightly more heavily shagreened than posterior part of enclosure; corbicular surface with few indistinct punctures, shagreening less granular and more even than on posterior surface. Mesepisternum with surface similar to mesoscutum. Metepisternum similar to corbicular surface but impunctate below. Middle basitarsus nearly parallel-sided. Hind tibia slender, little wider than basitarsus. Claws with large tooth on inner margin. Anterior tibial spur bent, with broad lamella along basal half on inner margin, spur serrate along distal half of inner margin; middle tibial spur long, nearly straight, serrate along inner margin; hind tibial spurs long, slender, nearly straight; posterior spur longest; spurs serrate along posterior margins. Wings with pterostigma large, nearly twice as wide as prestigma; three submarginal cells; first transverse cubital vein ending several vein widths from pterostigma.

Metasomal terga shiny, with scattered minute punctures, surface with fine reticular shagreening. Pygidial plate broadly rounded, with edges turned upward, triangular center portion abruptly elevated. Sternum 1 emarginate. Sterna with many fine punctures, surface with fine reticular shagreening.

*Vestiture:* White except hairs on tip of abdomen and tarsi amber. Hairs abundant, long, straight, very plumose except: those of facial fovea short; minute, simple setae on eye; hairs absent in center of clypeus; propodeal corbicular hairs few, simple in center, along dorsal margin hairs curved; terga 1-4 hairs (except for apical fasciae) fine, short, weakly plumose, with apical fasciae, interrupted medially on terga 1-3; sternal hairs similar to tergal hairs except subapical fimbriae of long hairs on sterna 3-5; trochanteral flocculus curved. Tibial scopa with long hairs, with few long simple branches,



hairs along anterior margin curved posteriorly; other leg hairs variable in structure.

**MALE.** *Measurements and ratios:* Length, 7.0 mm; width of mesothorax, 1.7 mm; wing length from tegula, 5.3 mm; facial length/width, 1.22; flagellar segment 1/segment 2, 1.0.

*Integument color:* Black except: tip of mandible amber; eye grey; clypeus yellow, with two large, lateral subtriangular, hyaline spots; flagellum red-brown below; wings and tegula as in female; terga and exposed sterna with broad amber apices; sterna otherwise dark red-brown; distal part of basitarsi and distitarsi yellow-brown; tibial spurs light amber; claws red-amber.

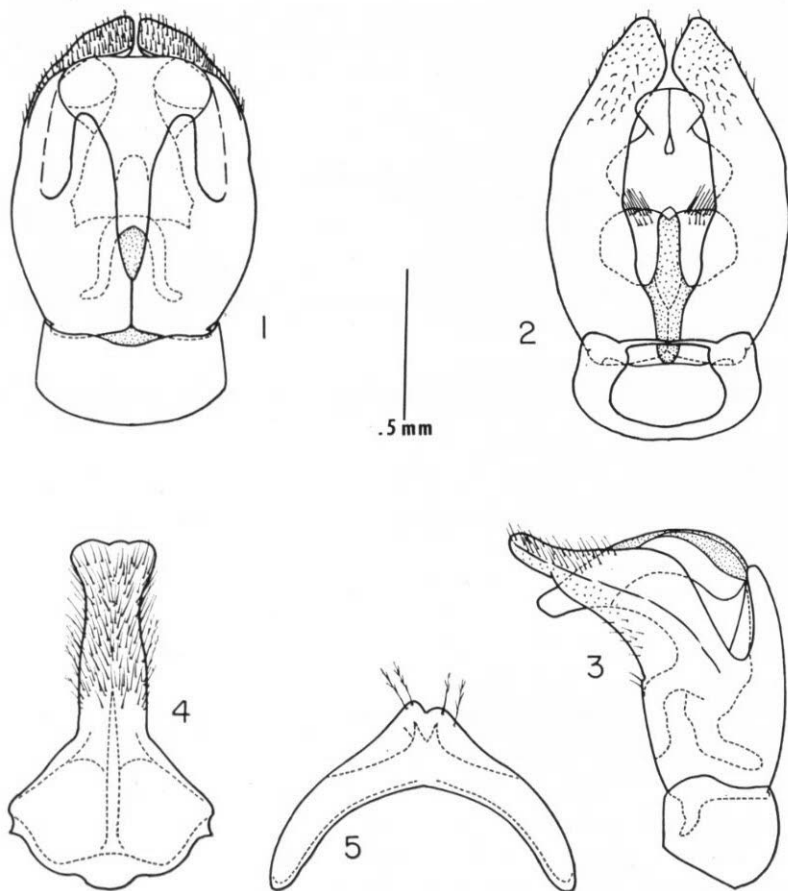
*Structure:* Antenna reaching just beyond scutellum; scape nearly reaching middle ocellus, slightly longer than flagellar segments 1-3; segment 1 as long as 2, nearly as long as 3, tapered towards base; second segment slightly tapered; middle segments slightly longer than broad; ultimate segment rounded in lateral view, pointed in dorsal view, nearly twice as long as broad. Eye three times as long as broad in anterior view, inner eye margins slightly convergent below. Malar space about four times as wide as long. Mandible as in female only slightly longer, narrower. Galea as in female. Maxillary palpus as in female but segments in ratio of about 1.0 : 1.5 : 1.1 : 1.1 : 1.0 : 1.0. Labial palpus as in female but segments in ratio of about 1.5 : 1.0 : 1.2 : 1.3. Labrum about two and a half times as wide as long, apical margin broadly rounded from side to side; process covering all but apical margin and lateral fourths of labrum, raised, shiny, expanded towards base, apex broadly emarginate. Clypeus twice as broad as long, shiny, protruding beyond lower margin of eye more than one and a half times width of eye in lateral view, punctures and shagreening as in female only shagreening on entire clypeus. Supraclypeal area, genal area, vertex and face above antennal fossae as in female.

Pronotum with strong humeral angle, ridge extending vertically from humeral angle interrupted by strong depressed suture, surface as in female. Mesoscutum and tegula as in female. Scutellum as in female except lateral elevated area less shiny, with stronger reticular shagreening. Metanotum as in female. Propodeum as in female except carinae much reduced, lateral area like posterior area. Mesepisternum as in female. Metepisternal sculpturing like propodeum outside enclosure. Wings, claws and tibial spurs as in female.

Metasomal terga as in female except tergum 6 emarginate on posterior margin, pygidial plate absent. Exposed sterna as in female except sternum 6 with apical margin undulating with margin alternately bent dorsad and ventrad.

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Sternum 7 weakly emarginate at apex with two small lobes, each bearing two long branched setae (fig. 5). Sternum 8 convex, with base expanded into large plate (fig. 4); apex slightly expanded, weakly trilobed; shaft longer than base; sternum with apical half setose; some setae branched; setae not reaching beyond apex. Gonocoxite bent downward; apex expanded in posterior view; posterior surface of apex very setose; few small setae below. Penis valve bent downward, apex expanded, medially expanded with dorsolateral lamellae (figs. 1-3).



FIGS. 1-5. Male terminalia of *Andrena miserabilis*. 1-3. Genital capsule in dorsal, ventral and lateral views. 4-5. Ventral views of sterna 8 and 7.

*Vestiture*: Color as in female. Hairs as in female except: fringe of hairs along ventral margin of clypeus; facial fovea absent; tergum 6 with longitudinal bare area in center; apical fasciae weak on terga 1-5; hairs specialized for pollen collecting absent.

VARIATION: Specimens from the southeastern United States (*scutellata*) possess reddish hairs on the scutellum, metanotum and posterior lobes of the pronotum (reddish coloration is more noticeable in females). Some specimens from the midwest and west coast show similar hair coloring. Other specimens show all gradations between *scutellata* hair color and specimens with all white hair on the thorax.

Female specimens with a broad impunctate area on the clypeus have been known as *miserabilis bipunctata* while those with a narrow impunctate area have been known as *m. miserabilis* (Mitchell, 1960), but intermediate specimens occur. The two forms are sympatric and are even found in the same nesting area (Mitchell, 1960). (No males were matched with *m. miserabilis* by Mitchell.) Both *scutellata* and *bipunctata* are extreme variations of *miserabilis* (Mitchell, 1960, postulated this for *bipunctata* but gave it sub-specific status) and do not warrant naming.

Specimens show a large variation in size. Female wing length varies from 5.5 to 7.4 mm, while that of the males varies from 4.8 to 6.8 mm. Males do not show the tendency noticeable in some *Opandrena* specimens in which the head size is increased disproportionately in relation to body size.

Males often have the lower ends of the parocular areas yellow.

TYPE MATERIAL: *A. miserabilis* was described from eight male and female specimens (Bosque County, Texas; G. W. Belfrage). Timberlake (in Muesebeck, *et al.*, 1951) lists the male (or males) as a misidentification. A male lectoparatype examined during the present study is identified correctly. The female lectotype (#2160), a male (#2160.3) and a female (#2160.2) lectoparatypes are in the Philadelphia Academy of Natural Sciences collection. The lectotype has the left flagellum missing. *A. bipunctata* was described from two males (Bosque County, Texas; G. W. Belfrage). The lectotype is in very poor condition and has legs missing. It is in the United States National Museum (#1440). The holotype of *pronitens* (344; Geneva Park, Boulder, Colorado; May 14, 1929; Hugo Rodeck) is in good condition and is in the University of California, Riverside, collection. The male holotypes of *clypeata* (St. John's Bluff, East Florida = St. John's River?; E. Doubleday) and *flavoclypeata* (Canada) are in the British Museum. Morice and Cockerell (1901) and Cockerell (1906) discuss these two types. There is a homotype of *flavoclypeata* in the North Carolina State collection. *A. scutellaris* (Florida) was described from 26 females and eight males. Specimens designated "lectotype" (female, #12222), "lectoallotype" (male,

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#12222), six male and 18 female "lectoparatypes" #122218-12221, 12223, 12225-12233, 12235, 12237-12240, 12244, 12290, 12302, 12305 and 12324) are in the Illinois Natural History Survey collection. The type of *pennsylvanicola* (from Connecticut?) could not be located.

**BIOLOGY:** Michener and Rettenmeyer (1956) give notes on the nesting activity of this species. Robertson (1891, 1928) found the bees *in copula* on *Salix* on April 10.

**PARASITES:** *Stylops bipunctatae* and *S. oklahomae* (Strepsiptera) have been recorded (Pierce, 1909, *et seq.*; Bohart, 1941). During the present study, stylopized bees (30 ♀ ♀, 18 ♂ ♂) were examined from Alabama, California, Florida, Georgia, Iowa, Nebraska, New Jersey, North Carolina, Ontario, Pennsylvania, Texas and Utah. In the literature, stylopized specimens are recorded also from Illinois, Indiana, Oklahoma, New York and Wisconsin. Such specimens are often abnormal in morphology (Salt, 1927; Ribble, 1965) and may not conform to the species description.

Mites (Scutacaridae) were found on two male bees from New York and a triungulin larva on a female from Oklahoma. Michener and Rettenmeyer (1956) indicate that this bee is a probable host of *Nomada* sp. and *Leucophora obtusa* (Anthomyiidae).

**SEASONAL ACTIVITY:** The seasonal activity and the peak populations for this species is during the months of April and May. In Nebraska, where it has been most often collected, specimens bear dates between April 12 and May 24, but at a specific locality during any year the activity period is about a month. A small percentage of the study material has been collected at times other than in April and May. Specimens have been collected as early as January 26 in Florida and as late as September 7 in Illinois. One specimen from Colorado was collected on October 12, 1956 (questionable data) and Viereck (1928) lists this bee as occurring in October in New York state.

**FLOWER RECORDS:** *A. miserabilis* visits a large variety of flowers (table 1). Although it has been collected on 34 families of plants nearly three-fourths of all collections are from Rosaceae and nearly half are from the genus *Prunus* (plum, prune, apricot, cherry and peach). Records from *Salix* (willow) account for more than half of the records from plants not belonging to Rosaceae. *Pyrus* (apple and pear) and *Crataegus* also show a number of records. *A. miserabilis* is a very common, widespread spring bee and surely plays a very important part in the pollination of fruit crops.

TABLE I

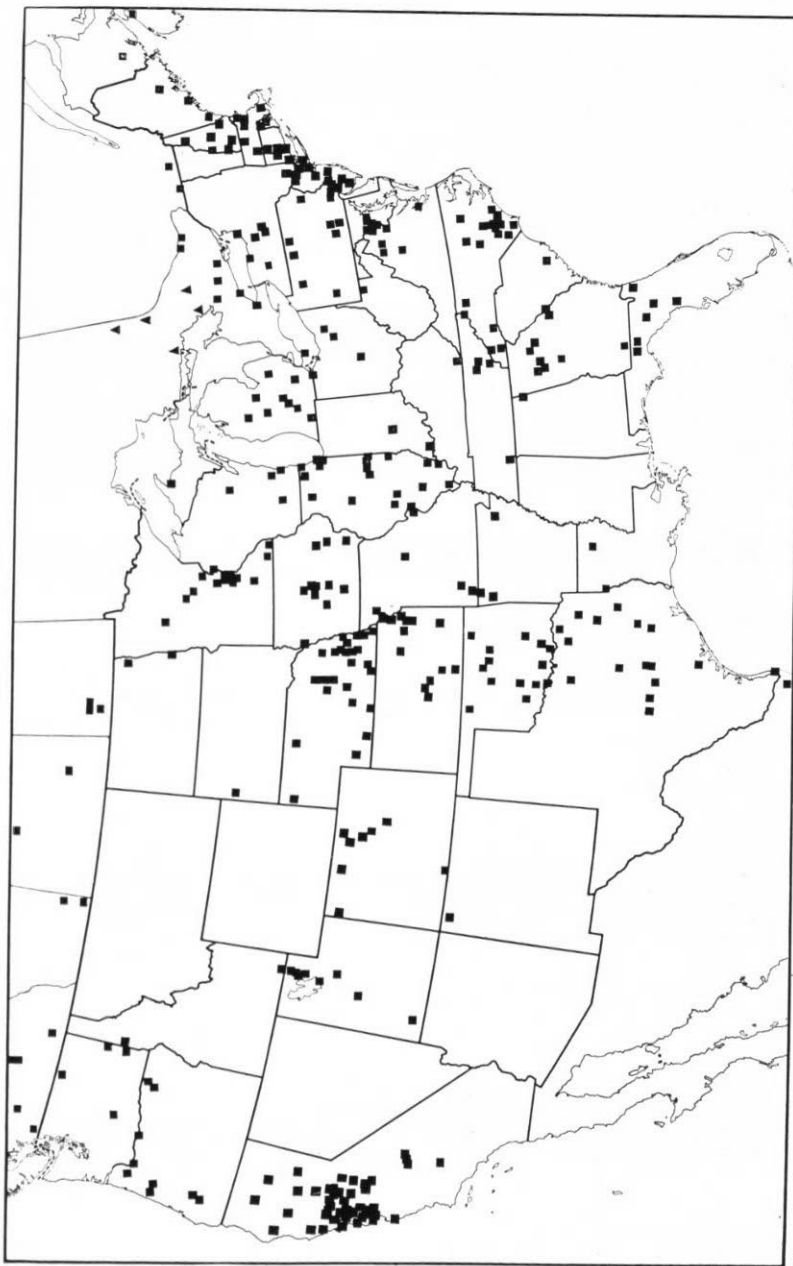
SUMMARY OF FLOWER RECORDS FOR *Andrena (Larandrena) miserabilis* CRESSON

FAMILY	Records of <i>A. (L.) miserabilis</i>					
	Number of genera	Number of species	Number of collections	Number of females	Number of males	Total number of bees
Aceraceae	1	1	3	0	4	4
Anacardiaceae	1	2	4	2	3	5
Aquifoliaceae	1	1	2	3	0	3
Berberidaceae	1	1	12	7	18	25
Boraginaceae	1	1	1	1	0	1
Caprifoliaceae	2	4(1)*	7	12	0	12
Caryophyllaceae	1	1(1)	1	1	0	1
Compositae	6(2)	6(2)	20	26	13	39
Convolvulaceae	1	1	1	1	0	1
Cornaceae	1	3(1)	9	7	5	12
Cruciferae	6(3)	7(3)	25	52	22	74
Ebenaceae	1	1	3	3	6	9
Elacagnaceae	1	1	1	0	1	1
Euphorbiaceae	1	1	1	2	0	2
Fagaceae	1	1	1	0	1	1
Labiatae	1	1	1	2	0	2
Lauraceae	2	2	3	3	1	4
Leguminosae	3	3	4	3	2	5
Liliaceae	1	1	1	0	1	1
Oleaceae	2	2	2	0	13	13
Onagraceae	1	1	1	0	2	2
Portulacaceae	1	1	1	1	0	1
Ranunculaceae	1(3)	1(3)	1	0	1	1
Rhamnaceae	2	2(1)	2	2	0	2
Rosaceae	12					
<i>Amelanchier</i>		1(1)	12	7	30	37
<i>Cercocarpus</i>		1	1	1	0	1
<i>Crataegus</i>		1(2)	35	69	41	110
<i>Cydonia</i>		1	1	2	0	2
<i>Exochorda</i>		1	2	5	1	6
<i>Fragaria</i>		1	6	20	1	21
<i>Prunus</i>		9	159	331	658	989
<i>Pyracantha</i>		1	6	15	0	15
<i>Pyrus</i>		5	61	107	52	159
<i>Rubus</i>		2	19	38	10	48
<i>Spiraea</i>		2	17	27	35	62
<i>Sorbaria</i>		1	1	3	0	3
Rutaceae	1(2)	1(2)	1	0	2	2
Salicaceae	1	8(1)	94	117	247	364
Santalaceae	(1)	(1)				
Saxifragaceae	2	2	7	3	20	23
Scrophulariaceae	1	1	1	1	0	1
Staphyleaceae	(1)	(1)				
Tamaricaceae	1	1	1	1	0	1
Umbelliferae	5(1)	6(1)	9	12	11	23
Violaceae	1	1	2	3	0	3
TOTALS	63(13)	91(21)	542	890	1201	2091

\* Number in parentheses are records from the literature which increase the host range taken from specimens.

*The Monotypic North American Subgenus Larandrena of Andrena*

RANGE: This species is widely distributed in North America, occurring across southern Canada south to central California, southern Texas and northern Florida (map 1). Collections indicate that



MAP 1. Range of *A. miserabilis*. The triangles in Ontario represent extensions of the range from Knerer and Atwood (1964).

it is absent in the arid southwestern United States. Some peripheral localities are: Hants Co., Nova Scotia (not on range map); Saskatoon, Saskatchewan; Bakersfield, Kern Co., California; 25 mi. S. Brownsville, Texas (in the state of Tamaulipas, Mexico); Inverness, Citrus Co., Florida.

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<sup>1</sup> Illinois Natural History Survey, formerly of the University of Nebraska.

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