Names Applied to Bees of the Genus Osmia, Found in North America

T. D. A. Cockerell
University of Colorado

Follow this and additional works at: https://digitalcommons.usu.edu/bee_lab_co
Part of the Entomology Commons

Recommended Citation
https://digitalcommons.usu.edu/bee_lab_co/490
NAMES APPLIED TO BEES OF THE GENUS OSMIA, FOUND IN NORTH AMERICA

BY

T. D. A. COCKERELL
Of the University of Colorado, Boulder

No. 1897.—From the Proceedings of the United States National Museum,
Vol. 42, pages 215–225
Published April 13, 1912

Washington
Government Printing Office
1912
NAMES APPLIED TO BEES OF THE GENUS OSMIA, FOUND IN NORTH AMERICA

BY

T. D. A. COCKERELL

Of the University of Colorado, Boulder


Published April 13, 1912

Washington

Government Printing Office

1912
This list is prepared in the same manner as the paper on the genus *Nomada*, which appeared in these Proceedings, vol. 41, pp. 225–243. Our knowledge of *Osmia* in America has very greatly increased in recent years, and in the absence of a catalogue it has been difficult to keep the numerous species in mind. Friese's revision of the Megachilidae of the world, published in *Das Tierreich*, November, 1911, includes the Nearctic *Osmia*, but unfortunately the manuscript was prepared ten years ago, and has not been brought up to date; it thus falls very far short of representing our present knowledge, although very valuable as far as it goes.

According to Titus, the type of *Osmia* Panzer is *O. rufa* (Linnaeus). The only American species which he considers strictly congeneric with *rufa* are *O. lignaria* and *O. propingua*. The genus is here interpreted in a broader sense, in accordance with the more usual custom. Robertson divides *Osmia* into a number of genera, but restricts the name *Osmia* to such species as *O. brevis, pumila, cobaltina*, and *atriventris*, applying the name *Ceratosmia* (Thomson 1872) to the *Osmia*, s. str. of Titus. Ashmead, however, recognized *Amblys* Klug (type, *bicornis*, which = *rufa*) as a genus distinct from *Ceratosmia*; he considered *Helicosmia* (the group of *O. aurulenta, bicolor*, etc.) to be identical with *Amblys*.

The genus *Osmia* is very rich in species throughout the temperate portions of the Northern Hemisphere. The American forms are mostly blue or green, some very brilliant, while those of Europe average much darker, with a much larger proportion of actually black species. 
insects. On the other hand, the pubescence of the Old World Osmiae is often very brightly colored, *O. ferruginea* and *O. pseudoaurulenta* from North Africa being covered with deep-red hair. The European species not rarely have red hair on the abdomen, while in the American, if there is such hair, it is on the thorax, or mainly so (see *O. novomexicana*, *O. cerasi*).

A species of *Osmia*, agreeing with the description of *O. texana* Cresson, was taken by Prof. C. H. T. Townsend on the Rio Nautla, State of Vera Cruz, in the tropical part of Mexico.

**SUBGENERA AND SECTIONS.**

**Centrosmia** Robertson.

*Type.*—*bucephala*. Also includes *tarsata*.

**Xanthosmia** Robertson.

*Type.*—*cordata*. Mandibles of female quadridentate.

**Gnathosmia** Robertson.

*Type.*—*georgica*. Mandibles of female with a large basal tooth.

**Monilosmia** Robertson.

*Type.*—*canaden sis*. Also includes *chlorops*. Male flagellum moniliform.

**Diceratosmia** Robertson.

*Type.*—*quadridentata*. This and *Nothosmia* have tridentate mandibles in the female.

**Leucosmia** Robertson.

*Type.*—*albiventer*. Also includes *nigritula*.

The above six, and also *Ceratosmia*, are defined in *Trans. Amer. Ent. Soc.*, vol. 29, 1903, pp. 165-166.

**Nothosmia** Ashmead.

*Type.*—*distincta*. Also includes *exigua*, according to Titus.

**Acanthosmioides** Ashmead.

*Type.*—*odontogaster*.

For the above two see *Trans. Amer. Ent. Soc.*, 1899, pp. 75-76.

**Melanosmia** Schmiedeknecht 1884. To this group Titus has referred *O. grandior*.

**TABLES.**

(7) Cockerell, *Canadian Entomologist*, April, 1909, p. 131. (Males with small joints of middle tarsi thickened.)
(8) Cockerell, *Entomological News*, June, 1910, p. 273. (Females of medium size, of a deep blue or purplish color, with the hair either all black or black with a slight admixture, easily overlooked, of light.)
LIST OF SPECIES.

[The asterisk (*) indicates that the species is in the collection of the United States National Museum. Certain few specimens sent to the Museum by Professor Cockerell and labeled "cotypes" are considered paratypes, as Professor Cockerell uses the name "cotype" in the sense which the Museum uses "paratype." A good many of the species in the collection are homotypes made by Titus, or were determined by Professor Cockerell. The Museum has a goodly lot of unworked material in this genus, and when this has been determined the number of species in its collection will be greatly increased. Of the 167 names in the following list, 60 are represented by specimens in the collection. Of these 60, 22 are types or paratypes.—S. A. Rohwer.]

In each case the type-locality and collector of the type is given, if known. There are also references to the tables, numbered as in the list above.

*abjecta* Cresson, 1878. Colorado (Ridings). Tab. 2.
A black species.

*abnormis* Cresson, 1878. Colorado (Ridings, Morrison).

Ventral scopa white.

albolateralis Cockerell, 1906. Florissant, Colorado (Cockerell). Tab. 2.
Possibly the female of *O. cyanemilens*.

amala Cockerell, 1907. Florissant, Colorado, June (Rohwer). Tab. 7.
Additional characters; Canadian Entomologist, 1910. p. 312.

Visits *Pulsatilla*. Mr. S. A. Rohwer took it at Boulder, May 15, 1908, at flowers of *Besseya plantaginea*.
Paratype.—Cat. No. 11919, U.S.N.M.

*armaticeps* Cresson, 1878. Colorado (Ridings, Morrison). Tab. 1, 2.

armaticeps sapellonis Cockerell, 1901. Hill above Beulah, New Mexico (Cockerell).
Female with cheeks very strongly and quite closely punctured; mesothorax strongly and densely punctured. Length, 12 mm.

*ashmeadi* Titus, 1904. Dalles, Oregon.
Allied to *O. odontogaster*, but the male is larger, deeper colored, and has the antennae with the scape black, the flagellum pale testaceous, excepting a black tip to the flattened last joint.
Type.—Cat. No. 6359, U.S.N.M.

West to Boulder, Colorado (S. A. Rohwer). Allied to *O. coloradella*, but clearly distinct.

atrocyanea Cockerell, 1897. Olympia, Washington State, July (Kincaid). Tab. 5, 8.
Female with hair of pleura, sides of metathorax, and scutellum black, that on scutellum with a few pale hairs intermixed; head strongly blue. Also in Ormsby County, Nevada (Baker).

azteca Cresson, 1878. Mexico (Sumichrast).
Black; ventral scopa yellow.

basilissa Cockerell, 1911. Claremont, California (Baker).
Magnificent deep purple; pubescence all black.

bella Cresson, 1878. Colorado (Morrison). Tab. 3.
Bright green.

bennetteae Cockerell, 1907. Boulder, Colorado, May (Mrs. C. Bennett). Tab. 3.
Brilliant green. Also in California.


botitena Cockerell, 1909. Lee County, Texas, April (Birkmann).
Ventral scopa yellowish-white. Allied to *O. subfasciata*.
Possibly the female of *O. cyaneonitens*.

* brevis Cresson, 1864. Rocky Mountains, Colorado. Tab. 4.  
Supposed male; Proc. Acad. Nat. Sci. Phila., 1897, p. 345. In Tab. 4 the male would run to *pumila*, but is much larger, like *enena*, but cheeks with some black hairs.

Brilliant blue-green.  
Male; Ann. and Mag. Nat. Hist., Oct., 1908, p. 330. The male has much coarse black hair on the clypeus, etc.  
A new locality is Durango, Colorado, May 27, 1899 (Oslar).  
_Type._—Cat. No. 5806, U.S.N.M.

bucconis Say, 1837. Indiana.  
_Same as Ashmeadiella bucconis._

*bucephaia Cresson, 1864. Great Slave Lake, British America. Tab. 4.  
*californica Cresson, 1864. Fort Crook, California (H. Ulke).  
_Female “shaped like *O. lignaria*, but is at once distinguished from that species by the black pubescence and the shape of the clypeus.” The clypeus is rather deeply emarginate._

* calla Cockerell, 1897. Olympia, Washington (Kincaid).  
_Bright green; pubescence of male nowhere mixed with black._  
_Paratype._—Cat. No. 6866, U.S.N.M.

* canadensis Cresson, 1864. Canada West (Wm. Saunders). Tab. 4.  


* cerasi Cockerell, 1897. Mesilla, New Mexico (Jessie E. Casad). Tab. 6.  
_Female with hair of thorax above bright rust-red; tegulae and ventral scopae black._  
_Paratype._—Cat. No. 3708, U.S.N.M.  
This specimen was determined by Cockerell but not designated as a type by him.  
_Titus considers it as a paratype._

_Steel blue; margin of female clypeus lobed in middle, the apex of the lobe emarginate, margin on each side of lobe crenulated._  
_occurs in Texas; see Univ. of Colorado Studies, vol. 5 (1907), p. 37._

* chlorops Cockerell and Titus, 1902. Trout Spring, New Mexico (Cockerell). Tab. 2.  
_Allied to *O. canadensis*._  
_Type._—Cat. No. 14480, U.S.N.M.

clarescens Cockerell, 1911. Claremont, California (Baker).  
_Female with ventral scopae black; hair of pleura and metathorax white; legs metallic._

_Brilliant deep blue or purple._  
_Baker has taken it at Claremont, California._


collinsire Robertson, 1905. Illinois (Robertson).  
_This is the insect earlier described by Robertson as the male of *O. major*._

_Allied to *C. atriventris*._  
_Recent studies indicate that this is apparently a variety of *O. hesperella._

coloradensis Cresson, 1878. Colorado (Ridings, Morrison).  
_“Ventral scopae white or yellow.” Apical margin of female clypeus coarsely crenulated._  
_Also found in Ormsby County, Nevada (Baker), and at Peachland, British Columbia, Aug. 2 and 6, 1909 (J. B. Walls).  
_It is doubtful whether *O. hypochrysea rohweri* can be separated from this; specimens from Flagstaff, Arizona, are intermediate._
**conjuncta** Cresson, 1864. Connecticut (E. Norton).
Punctures of female abdomen much stronger and less dense than in *O. albiventris*.
Ventral scopa white.

**conjunctoides** Robertson, 1893. Citrus County, Florida (Robertson).
Male resembles *conjuncta*, having the same two tubercles, one above the other, on front; but lateral teeth of sixth segment broad and obtuse and produced downwards (acute in *conjuncta*).

**copelandica** Cockerell, 1908. Copeland Park, Colorado (Rohwer).
Small black species with white scopa; abdomen slightly metallic. It is not unlike *O. abjecta*, but smaller, and easily separated by the scopa, which in *abjecta* is reddish-black. There is a superficial resemblance to *O. insularis* Schmkn. from Mallorca.

**cordata** Robertson, 1902. Illinois (Robertson). Tab. 4.
"May be the male of *O. brevis*" (Robertson), but later Robertson found the female, which proves it to be quite distinct, the ventral scopa being yellowish. The male has the first ventral segment of abdomen emarginate.

**cressonii** Dalla Torre, 1896.
Same as *conjuncta*; the name was proposed by Dalla Torre for *quadridentata* Cresson, not of Duméril, 1860. Duméril's insect was described under *Phyllotoma*, and appears to be of doubtful identity.

**cyanella** Cockerell, 1897. Olympia, Washington State, May (Kincaid).
Female about 9 mm. long, very broad, with large subquadrate head.
_Type._—Cat. No. 6364, U.S.N.M.

**cyanonigens** Cockerell, 1906. Florissant, Colorado (Rohwer). Tab. 1, 2.
A new locality is Durango, Colorado, June 7, 1898 (Osler).

**davidsoniella** Cockerell, 1905. Los Angeles, California (Davidson).
Male steel-blue, a little over 8 mm. long; antennae black.
_Type._—14479, U.S.N.M.

**densa** Cresson, 1864. Pikes Peak, Colorado. Tab. 1, 5.
The color of the female abdomen resembles that of *hendersoni*; but hair of pleura is white (black in *hendersoni*).

**distincta** Cresson, 1864. Connecticut (E. Norton).
Ventral scopa white; female broader and more robust than *albiventris* or *conjuncta*.

**dubia** Cresson, 1864. Pikes Peak, Colorado.
Resembles *O. atriventris*. Ventral scopa black.
The fossil "*Osmia* dubia" Germar 1849, was described as *Apiaria dubia*, and the reference to *Osmia* by Giebel (1856) is probably erroneous. Hence I think Cresson's name for our species may remain.

**edna** Cockerell, 1907. Boulder, Colorado, May (Edna Baker). Tab. 3.

**enana** Cockerell, 1907. Florissant, Colorado, June 23 (Rohwer).
Male resembles *O. mertensiae*, but antennae longer, legs not metallic, abdomen narrower and less shining, etc.

**eutrichosa** Cockerell, 1910. Steamboat Springs, Colorado (Cockerell).
Male with no black hair anywhere.

**exigua** Cresson, 1878. California (Henry Edwards).
Very small. "This is our smallest species" (Cresson, 1878).
Titus refers this to *Nothosmia*, and states that *Heriades glaucum* Fowler is a synonym.

**faceta** Cresson, 1878. "Can., N. Y., Ga." Tab. 5.
Allied to *O. chalybea*.
Ventral scopa black, but white hair on lateral margins of abdomen. Fedor, Texas (Birkmann).
Kerrville, Texas, at flowers of *Marrubium vulgare*, Apr. 12, 1907 (F. C. Pratt).
Allied to O. densa.

florissanticola Cockerell, 1906. Florissant, Colorado (Cockerell). Tab. 2.

foxi Cameron, 1901. “Sta. Fe Mts, New Mexico,” but really Mexican.
Male 8 mm., said to be allied to texana and subfasciata; legs largely metallic.

frigida Smith, 1854. Hudson Bay.
A black species, the female with a very large head; ventral scopa black.

*fulgida Cresson, 1864. Rocky Mountains, Colorado. Tab. 1.
A bright green species.
New localities are Ouray, Colorado (H. F. Wickham), Denver, Colorado (Osler),
and South Park, Colorado (Osler.)

gabrielis Cockerell, 1910. San Gabriel Mountains, California, 3,000 feet. (Grinnell).
Tab. 8.
Visits Gaillardia in July. Ventral scopa black.

*gaudivs Cockerell, 1907. Boulder, Colorado, April (Edna Baker). Tab. 3
Brilliant golden green. Also at Florissant; see Ann. and Mag. Nat. Hist., Oct.,
1908, p. 330. The male type had the vertex, front, and thorax above with a
strong suffusion of coppery-red or almost crimson; after four years, although the
specimen was kept in the dark, this has faded to golden.

georgica Cresson, 1878. Georgia (Morrison). Tab. 4.
Female with clypeus carinate and mandibles tuberculate; ventral scopa yellowish.
giilarum Cockerell, 1906. Florissant, Colorado (Rohwer). Tab. 2.

*globosa Cresson, 1864. Great Slave Lake, British America.
A small robust black species.
Male entirely black with white pubescence.
*grandior Cockerell, 1897. Olympia, Washington State, May (Kincaid).
Resembles O. pascoensis; clypeus dull and roughened (in pascoensis shiny, with
well-separated punctures).
Paratype.—Cat. No. 6809, U.S.N.M.

granulosa Cockerell, 1911. Mountains near Claremont, California (Baker).

grinnelli Cockerell; 1910. Strawberry Valley, San Jacinto Mountains, California
(Grinnell).

hendersoni Cockerell, 1907. Arapahoe Peak, Colorado (Rohwer). Tab. 1.
A high alpine species.
Ventral scopa yellowish-white. Allied to O. albicentrirns.
I have taken it at flowers of Cirsium, June 26.

hudsonica Cresson, 1864. Hudson Bay Territory.
A black species.
hypochrysea Cockerell, 1906. Florissant, Colorado (Rohwer). Tab. 2.
Ventral scopa pale orange; anterior margin of clypeus (female) with a median
tridentate elevation.
Also at Claremont, California, where it is variable (Baker).
Larger, with the mesothorax more sparsely punctured.
Also at Flagstaff, Arizona, at flowers of Iris, June 11, 1909 (F. C. Pratt).
Very close to O. coloradensis (which also occurs at Boulder, collected by W. P.
Cockerell), but the mesothorax is shining steel blue (blue-black and dull in
coloradensis), and sparsely punctured about the middle.
The two species are very doubtfully distinct.
Looks like Monumetha. The male, discovered by Oslar at Durango, Colorado, shows that this species must be referred to Alcidamea.

Perhaps a subspecies of O. pentastenomia, which occurs at higher altitudes.

illinoensis ROBERTSON = Male of cobaltina, according to Robertson; see Ent. News, 1902, p. 79.
In spite of Robertson's decision, I can hardly believe this is cobaltina, which is a species of the Pacific coast region.
Male entirely bright green, 8 mm. long; pubescence "white below, especially on clypeus, where it is also dense, above slightly tinged with ochraceous; on abdomen short and appearing subfuscous."

inermis ZETTERSTEDT, 1838. A species of northern and central Europe, said by Friese (1908) to occur in Labrador. Female 9½, male 8 to 9 mm.; black; thorax and first abdominal segment of female with fulvous hair above.

inspergens LOVELL and COCKERELL, 1907. Maine (Lovell).
Ventral scopal silvery-white, black at apex; lower part of female clypeus covered with very dark brown pubescence. Also in Massachusetts.

integra CRESSON, 1878. Colorado (Morrison).
Male steel-blue. Also in New Mexico.
At Claremont, California, Baker has taken a variety of the male with the hair of cheeks (except above) and of anterior legs black.

Possibly a variety of O. universitatis.

*inurbana CRESSON, 1878. Colorado (Ridings, Morrison).
Dark brassy green (male).

iridis COCKERELL and TITUS. Trout Spring, New Mexico (Cockerell).
Male with first ventral segment of abdomen emarginate; sixth dorsal entire.

juxta CRESSON, 1864. Rocky Mountains, Colorado.
Allied to O. longula.

*kincaidii COCKERELL, 1897. Olympia, Washington State (Kincaid).
Brilliant peacock-green.
Paratype.—Cat. No. 6867, U.S.N.M.

*latissaris CRESSON, 1864. "New York, Virginia."
Same as bucephala.


*ligaria SAY, 1837. Tab. 4, 6.
Extends southwest to New Mexico.

ligaria ligariella COCKERELL, 1906. Romeroville, New Mexico (W. Porter).
Female 9½ mm. long; pale hair on abdomen practically confined to first segment. Peraps a distinct species.

ligicola PROVANCHER, 1882. Cap Rouge.
Same as bucephala.

ligivora PACKARD, 1867. "From cells in maple."
Female about 13 mm. long; hair of face below antennae dark chocolate; ventral scopal largely reddish. See Univ. of Colorado Studies, vol. 5 (1907), p. 37.

*longula CRESSON, 1864. Rocky Mountains, Colorado.
Resembles O. florissanticola. Mr. S. A. Johnson took it at Sapinero, Colorado, July 20, 1908.

Type.—Cat. No. 13545, U.S.N.M.
major Robertson, 1902. Illinois (Robertson). Tab. 4.
Near to atriventris, but larger; female 11, male 10 mm.

Superficially like O. wilmatte, but thorax above with much more black hair, ocelli larger, face with tufts of white hair.

* mandibularis Cresson, 1878. Colorado (Morrison).
Female with nodose process on mandibles.

marginipennis Cresson, 1878. Colorado (Morrison).
"May be the male either of longula or juxta" (Cresson).

Entirely deep black, with black hair.

megacephala Cresson, 1864. Rocky Mountains, Colorado.
Resembles O. becephala.

Resembles O. atriventris. Also in Colorado.

mertensiae Cockerell, 1907. Florissant, Colorado, June (Rohwer).
Visits Mertensia.

Visits Ribes pumilum.

* montana Cresson, 1864. Pike's Peak, Colorado.
Male with wings purely hyaline.

* nanula Cockerell, 1897. Seattle, Washington, April and May (Kincaid).


Paratype.—Cat. No. 13439, U.S.N.M.

* nifosta Cockerell, 1909. Trouble some, Colorado, June (Rohwer).
Abdomen of male with a ventral tooth. Allied to O. odontogaster and O. ashmeadii, the three forming the subgenus Acanthosmioides.

Paratype.—Cat. No. 14432 U.S.N.M.

* nigrifrons Cresson, 1878. Colorado (Morrison). Tab. 1. 5.
Hair of pleura black, of scutellum light, with at most a few dark hairs intermixed.
Extends to Washington.
A new locality is Durango, Colorado, May 26, 1899 (Oslar).

nigrifrons subaustralis Cockerell, 1900. Beulah, New Mexico (W. Porter).
Female 10 mm.; anterior margin of clypeus with a broad shallow emargination.

nigritula Friese, 1902.

Also in Colorado. Related to O. grandior.

Type.—Cat. No. 6362 U.S.N.M.

oblonga Provancher, 1882.—Monumetha albifrons.
First described as a Megachile, and name preoccupied.

* odontogaster Cockerell, 1897. Olympia, Washington (Kincaid).
Resembles O. inurbana; second ventral abdominal segment of male toothed.

Paratype.—Cat. No. 3709, U.S.N.M.

Male with hind basitarsus toothed.
A variety of the male (variety a) with the thorax above without black hairs, was taken by Mr. S. A. Rohwer at Boulder, April 14, 1907, at flowers of Ribes pumilum.

parva Provancher, 1882. Canada.
Same as nigritula.
parvula Dalla Torre, 1896. (Name preoccupied.)
Same as nigritula.

pasadenae Cockerell, 1910. Pasadena, California (Grinnell).

Female about 15 mm.; hair of head entirely black, except a yellowish-white fringe on occipital margin.
Paratype.—Cat. No. 6568, U.S.N.M. Not labeled as a paratype by Cockerell, but determined by him.

pentstemonis Cockerell, 1906. Florissant, Colorado (Rohwer). Tab. 1. 2.

Female about 15 mm.; hair of head entirely black, except a yellowish-white fringe on occipital margin.

paratype.—Cat. No. 6868, U.S.N.M. Not labeled as a paratype by Cockerell, but determined by him.

pentstemonis Cockerell, 1906. Florissant, Colorado (Rohwer). Tab. 1. 2.

Female about 15 mm. long, hair of head and thorax above very bright fox red.

pentstemonis Cockerell, 1906. Florissant, Colorado (Rohwer). Tab. 1. 2.

Female about 15 mm. long, hair of head and thorax above very bright fox red.

peronota Cockerell, 1910. Steamboat Springs, Colorado (Cockerell).
Also in New Mexico. Female about 14 mm. long, hair of head and thorax above very bright fox red.

physarum Cockerell, 1907. Florissant, Colorado, June 1 (Rohwer).
Male with sixth dorsal segment entire; flagellum very strongly crenulate beneath.

pikni Cockerell, 1907. Halfway House, Pike’s Peak, Colorado (Cockerell). Tab. 1. 3.

Visits Salix at end of May.

platyrus Cockerell, 1911. Mountains near Claremont, California (Baker).

pogonigera Cockerell, 1910. Strawberry Valley, San Jacinto Mountains, California (Grinnell).

*pupinqua Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*pupina Cresson, 1864. Fort Crook, California (H. Ulke). Tab. 1.

Allied to O. lignaria. Specimens from Claremont, California, are in the Baker collection.

*ribifloris* Cockerell, 1900. Romeroville, New Mexico, April 29 (W. Porter).

Tab. 8.

Female 11 mm., dark shining blue, pubescence all black, legs blue. Allied to *O. cobaltina*, but much darker. Specimens in the Baker collection were obtained by Oslar at Santa Fe, New Mexico, and Thumb Butte, Phoenix, Prescott, and Copper Basin, in Arizona. A species from Arizona, named by Titus in manuscript after Biedermann, differs in being green, but is probably only a race. It has a broader abdomen than normal *ribifloris*.

Paratype.—Cat. no. 14473 U.S.N.M.


Said to be a variety of *O. albiventer*: the male has the hair of thorax above bright rust-red.

sancterosae Cockerell, 1910. Santa Rosa Mountains, California, 7,500 feet (Grinnell).

seneciocephala Cockerell, 1907. Florissant, Colorado (Rohwer).

Also in New Mexico, at 11,000 feet. Third ventral abdominal segment of male with a semicircle of long pale orange hairs in the median emargination.


*sericea* Cresson, 1864. Rocky Mountains, Colorado.

"Somewhat resembles *O. purpurea* (male), but the punctuation of the abdomen is finer, and the segments have no appearance of an apical whitish fringe" (Cresson). Abdomen black, faintly tinged with blue and purple.

*simillima* Smirr, 1854. "Nova Scotia; United States (Lieut. Redman)."

Closely resembles *O. ceruleascens* of Europe and Asia. See Trans. Amer. Ent. Society, 1905, p. 332, for notes on supposed type, which, however, does not accord well with Smith's description.

*spoliatia* Provancher, 1888.

Same as *Andronicus cylindricus*.


Female in Tab. 4 runs to *O. major*: it is very like *simillima*, but differs by the broader face and absence of black hair on vertex and clypeus. Middle tooth of mandibles is much nearer to the outer than the inner tooth, as in *O. major*.

*subfasciata* Cresson, 1872. Texas (Belfrage).

"Ventral scopa pale ochraceous;" but white in supposed type. See Univ. of Colorado Studies, Dec. 1907, p. 37. Birkmann has taken it in Lee County, Texas, at flowers of *Phacelia*.

Six females from Terrell, Texas (F. C. Bishop), are peculiar for their olive-green color, and seem to represent a local race.

Paratype.—Cat. No. 1770, U.S.N.M.

*subbornata* Cockerell, 1897. Olympia, Washington, June (Kincaid).

Female 14 mm. long, pure black; hair of thoracic dorsum black on disk with a pale band before and behind.

Paratype.—Cat. No. 6879, U.S.N.M.

*subpurpurea* Cockerell, 1897. Olympia, Washington, May (Kincaid).

Female about 14 mm. long, dark steel blue; hind margins of abdominal segments 2 to 5 each, with a thin and narrow, but evident, white hair-band.

Paratype.—Cat. No. 6873, U.S.N.M.

*subtrevoris* Cockerell, 1906. Near Lake George, Colorado (Rohwer). Tab. 2.

tarsata Provancher, 1888. Cap Rouge.

Belongs to *Centrosmia*, according to Titus, who redescribes the male; Proc. Ent. Soc. Wash., vol. 7, 1906, p. 158. It is 9 mm. long, blue-black, abdomen shining blue, tarsi of middle legs deformed much as in *bucephala*.

texana Cresson, 1872. Texas (Belfrage).

Male dark green or blue-green, with pale pubescence; legs black.
*titusi* Cockerell, 1905. Los Angeles, California (Davidson).


Ventral scopa white. Also at Las Cruces, New Mexico (C. H. T. Townsend).

*tristella* Cockerell, 1897. Olympia, Washington (Kincaid).

Pubescent of face, vertex, thoracic dorsum and ventral scopa wholly black.


*vallicola* Cockerell, 1907. Florissant, Colorado, June (Rohwer).

Visit *Ribes*. Superficially like *O. mertensi*; male flagellum wholly dark; legs strongly metallic.

*vicina* Cresson, 1864. Virginia.

Same as *pumila*.

*viridimicans* Cockerell, 1897. Olympia, Washington (Kincaid).

Female brilliant peacock-green, with the pubescence entirely black; abdomen somewhat elongate and nearly parallel sided.


Allied to *O. marginipennis*.

Also from Chimney Gulch, Colorado, May 9, 1899 (Oslar).

*viridis* Cresson, 1864. Rocky Mountains, Colorado.

Same as *fulgida*, or possibly a distinct but very closely-related form.

*wardiana* Cockerell, 1907. Ward, Colorado, 9,200 feet (W. and T. Cockerell).

Tab. 1.

Also at Georgetown, Colorado, in the Baker collection.

*watsoni* Cockerell, 1911. Albuquerque, New Mexico (J. R. Watson).

Male antenna with last joint flattened, more or less discoid, shining black.

*wheeleri* Cockerell, 1906. Florissant, Colorado (Rohwer). Tab. 1, 2.

The male has the hind basitarsus toothed.


Allied to *O. brevis*. Typical *wilmattae* has a good deal of black hair mixed with the white on scutellum. The two following are regarded as varieties of *wilmattae* (female), but are possibly distinct:

Variety *a*. Hair of scutellum white; mesothorax shining green; face rather narrower; hair of face and vertex coarse and black, a little white on occiput; hind margins of abdominal segments shining olive-green. Florissant, Colorado, June 21 (S. A. Rohwer).

Variety *b*. Hair of scutellum at least nearly all white; mesothorax dull blue-black; hair of face and vertex coarse and black, a little white on occiput; hind margins of abdominal segments dark purple. Copeland Park, Boulder County, Colorado, Sept. 1907 (Hite).

The following species are only known in the male sex: *Osmia abnormis, amala, aprilita, chlorops, collinisae, conjunctoides, cyaeneotena, davidsoniella, enca, eutrichosa, exigua, fazi, integrar, integrella, inurbana, iridis, marginipennis, mertensia, metilia, montana, nigritula, pasadenre, physarire, pseudamala, pulsatillre, pusilla, rustica, seneciochila, sericea, tarsata, texana, universitatis, vallicola, viridi or, watsoni, and wheeleri.*

The following, with black ventral scopa, are only known in the female sex: *armaticeps, atrocyanea, brevihirta, californica, cara, casta, cerasi, cyaenella, florissanticola, gabriellis, gaullardic, giliarum, grandior, grindeliz, grimmell, hendersoni, hypoleuca, juxta, leonis, lignariella, longula, malina, megacephala, nassa, nigfrons, nigfrons subaustralis, novomexicana, pascoensis, permorata, pikei, pogonios, putata, quadriceps, sancta-rose, senior, stasima, subtrevis, trevoris, tristella, wardiana, and wilmattae.*