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Names Applied to Bees of the Genus *Nomada* Found in North America

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H. Osborn

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GENUS NOMADA FOUND IN
NORTH AMERICA

BY

T. D. A. COCKERELL

Of the University of Colorado, Boulder

No. 1852.—From the Proceedings of the United States National Museum,
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NAMES APPLIED TO BEES OF THE GENUS *NOMADA*,
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By T. D. A. COCKERELL,
Of the University of Colorado, Boulder.

Having recently had occasion to classify a large number of *Nomada* for the United States National Museum, I have thought it useful to present for publication a list of the names applied to the American species of this genus. The need for such a list is evident, none having appeared since that of Cresson, published in 1887, which included only 73 names.

All the names are cited in alphabetical order, followed by the name of the author and date of publication. Whenever known, the type-locality is given, and also the name of the collector of the type. References are also made to all the principal synoptic tables, which are enumerated below, and referred to by number in the list.

SUBGENERA AND SECTIONS.

- Gnathias* ROBERTSON, 1903. Species with an inner tooth on the mandibles; includes *N. cuneata*, *ovata*, *bella*, *washingtoni*, *grayi*, *rhodomelas*, etc.
- Cephen* ROBERTSON, 1903. Scape of male normal; front coxæ of female with long pubescent spines.
Type.—*N. texana*; also includes *fervida*, etc.
- Centrias* ROBERTSON, 1903. Scape of male robust; front coxæ of female with long pubescent spines.
Type.—*N. erigeronis*.
- Phor* ROBERTSON, 1903.
Type.—*N. integra*. Also includes *N. subgracilis*.
- Heminomada* COCKERELL, 1902.
Type.—*N. obliterata*.
- Micronomada* COCKERELL and ATKINS, 1902. Species of the type of *N. modesta*.
- Xanthidium* ROBERTSON, 1903. Species of the type of *N. luteola*; includes *N. civilis*, *citrina*, *dentarix*, etc.
- Holonomada* ROBERTSON, 1903. *N. superba* and its allies; includes *N. edwardsii*, *vinnula*, *vincta*, *affabilis*, etc.

¹ The asterisk (*) indicates that the species is in the collection of the United States National Museum. Specimens sent to the Museum by Prof. T. D. A. Cockerell labeled as cotypes are considered as paratypes, as Professor Cockerell uses the word "cotype" in the sense that the Museum uses the word "paratype." Of the 273 names in this list, representatives of 112 are in the Museum collection. The Museum collection contains types of 44 of the species and paratypes of 7 additional ones. The catalogue number of the type or paratype, when in the United States National Museum, has been added after the other information.—S. A. ROHWER.

Nomadula COCKERELL, 1903.

Type.—*N. articulata* (*americana* auctt.). Antennæ of male peculiar. Includes also *N. martinella*, *scita*, *scitiformis*, *erythrochroa*, and *sophiarum*.

Melanomada COCKERELL, 1903.

Type.—*N. grindeliæ*. Male entirely black, female with red abdomen.

I can not distinguish *Cephen* from *Micronomada*.

TABLES.

- (1) Cockerell, Bull. 94, Colo. Agric. Exp. Sta., pp. 70-75. (Dated December, 1904, but published early in February, 1905: Species of Rocky Mountains.)
- (2) Cockerell, Bull. 94, Colo. Agric. Exp. Sta., p. 82. (Allies of *N. pallidella*.)
- (3) Cockerell, Bull. 94, Colo. Agric. Exp. Sta., p. 84. (Allies of *N. coloradensis*.)
- (4) Cockerell, Proc. Acad. Nat. Sci. Phila., 1903, pp. 559-561. (Species of California.)
- (5) Cockerell, Proc. Acad. Nat. Sci. Phila., 1903, pp. 580-582. (*Xanthidium* and *Holonomada*.)
- (6) Cockerell, Proc. Acad. Nat. Sci. Phila., 1903, p. 589. (Red species.)
- (7) Cockerell, Proc. Acad. Nat. Sci. Phila., 1903, p. 591. (*Centrias* and *Nomadula*.)
- (8) Cockerell, Proc. Acad. Nat. Sci. Phila., 1903, p. 593.
- (9) Cockerell, Proc. Acad. Nat. Sci. Phila., 1903, pp. 594-596. (*Gnathias*.)
- (10) Cockerell, Proc. Acad. Nat. Sci. Phila., 1903, pp. 608-610. (*Micronomada* and *Centrias*.)
- (11) Cockerell, Univ. of Colorado Studies, vol. 4 (1907), pp. 247-248.
- (12) Robertson, Canadian Entomologist, June, 1903, pp. 173-179.

LIST OF SPECIES.

- * *accepta* CRESSON, 1878. "Colorado, Kansas (Snow, male, Morrison, female)." Tab. 1.
- adducta* CRESSON, 1878. Colorado (Morrison). Tab. 1.
- * *affabilis* CRESSON, 1878. "New York; Illinois." Tab. 5, 12.
- * *affabilis dallasensis* COCKERELL, 1911. Dallas, Texas (Crawford and Pratt). Subgen. *Holonomada*.
- Type.—Cat. No. 13434, U.S.N.M.
- agynia* COCKERELL, 1905. Golden, Colorado, July (Gillette). Tab. 1.
- * *albofasciata* SMITH, 1879. Canada. Tab. 1, 9.
- Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 312. Subgen. *Gnathias*.
- Distribution in U. S.; Proc. Acad. Nat. Sci. Phila., 1903, p. 602.
- alpha* COCKERELL, 1905. Fort Collins, Colorado, May 20 (Bishopp). Tab. 1.
- * *americana* KIRBY, 1837. Hudson Bay.
- Confusion as to identity. See Trans. Amer. Ent. Soc., vol. 31, p. 310.
- amoena* CRESSON, 1863. Rock Island, Illinois.
- Viereck reports that the type is not in Philadelphia.
- * *angelarum* COCKERELL, 1903. Los Angeles County, California (Coquillett). Tab. 4.
- Type.—Cat. No. 13158, U.S.N.M.
- annulata* SMITH, 1854. "North America" (Murchison).
- Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 311.
- antonita* COCKERELL, 1909. Antonito, Colorado.
- * *aquilarum* COCKERELL, 1903. South Fork of Eagle Creek, New Mexico (Townsend). Tab. 1.
- Visits *Erigeron* in August.
- Type.—Cat. No. 13183, U.S.N.M.
- * *arizonica* COCKERELL, 1911. Arizona (Carl F. Baker). Subgen. *Xanthidium*.
- Type.—Cat. No. 14024, U.S.N.M.
- armata* HERRICH-SCHAEFFER, 1839. Europe.
- Nova Scotia. Female with head and thorax black; anterior margin of clypeus ferruginous; thorax marked with ferruginous; abdomen ferruginous, base black, second segment with an oval yellow spot on each side. Labrum of male armed with a sharp tooth in the middle.

- **armatella* COCKERELL, 1903. Canada. Tab. 3.
 Type.—Cat. No. 13174, U.S.N.M.
- **articulata* SMITH, 1854. "North America" (Doubleday). Tab. 12. (As *Centrias americanus*.)
 Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 312.
 This has been erroneously known as *N. americana*.
- **ashmeadi* COCKERELL, 1903. Los Angeles County, California (Coquillett). Tab. 4.
 Type.—Cat. No. 13173, U.S.N.M.
- astori* COCKERELL, 1903. Corvallis, Oregon, May and June (Cordley). Tab. 6.
 Possibly a variety of *N. ultima*.
- atroofrontata* COCKERELL, 1903. S. California. Tab. 4.
 Allied to *N. ultima*.
- aztecorum* COCKERELL, 1903. Amecameca, Mexico, September (Barrett).
 Female about 11 mm.; black with bright yellow markings; tegulae bright ferruginous; legs black and red.
- banksi* COCKERELL, 1907. Glencarlyn, Virginia, October (N. Banks).
- **belfragei* CRESSON, 1878. Texas (G. W. Belfrage).
- **belfragei xanthogaster* COCKERELL, 1911. Texas (G. W. Belfrage).
 Type.—Cat. No. 13427, U.S.N.M.
- **bella* CRESSON, 1863. Massachusetts; Connecticut. Tab. 1, 6, 9. Subg. *Gnathias*.
 Distribution; Proc. Acad. Nat. Sci. Phila., 1903, p. 601.
- **bella callura* COCKERELL, 1911. West Cliff, Colorado (Cockerell). Subg. *Gnathias*.
 Type.—Cat. No. 13437, U.S.N.M.
- **bethunei* COCKERELL, 1903. Canada. Tab. 3.
 Table contrasting *bethunei* with *armatella*; Proc. Acad. Nat. Sci. Phila., 1903, p. 607.
 Type.—Cat. No. 13159, U.S.N.M.
- beulahensis* COCKERELL, 1903. Beulah, New Mexico, August (Cockerell). Tab. 1.
 Allied to *N. interruptella*.
- bifurcata* COCKERELL, 1903. S. California. Tab. 4.
 Allied to *N. sayi*.
- bisignata* SAY, 1824.
 Robertson (1898) stated that this could not be identified, as he knew three species agreeing with Say's description.
- borealis* ZETTERSTEDT, 1838. Europe.
 Description of specimen from Nova Scotia; Trans. Amer. Ent. Soc., vol. 31, p. 311.
- californiæ* COCKERELL, 1903. S. California. Tab. 4.
 Allied to *N. erythræa*.
- **carolinæ* COCKERELL, 1903. North Carolina. Tab. 9.
 Very close to *N. cuneata*.
- ceanothi* COCKERELL, 1907. Glencarlyn, Virginia (N. Banks).
 Allied to *N. florilega*. Visits *Ceanothus* in June.
- citrina* CRESSON, 1878. California (Henry Edwards). Tab. 5.
- citrina rufula* COCKERELL, 1903. Grangeville, Idaho. Tab. 5.
- **civilis* CRESSON, 1878. Colorado (Ridings, Morrison). Tab. 1, 5.
 Female; Entomologist, 1909, p. 93.
- civilis spokaneensis* COCKERELL, 1910. Spokane, Washington (W. M. Mann). Subg. *Xanthidium*.
- clarkii* COCKERELL, 1903. Corvallis, Oregon, April 6 (Cordley). Tab. 6.
- **collinsiana* COCKERELL, 1905. Fort Collins, Colorado (S. A. Johnson). Tab. 1, 11.
- coloradella* COCKERELL, 1905. Fort Collins, Colorado. Tab. 1.
- coloradensis* COCKERELL, 1903. Montrose, Colorado (Gillette). Tab. 1, 3.
 Male, and history of type; Bull. 94, Colo. Agric. Exp. Sta., p. 84.
- **coquilletti* COCKERELL, 1903. Santa Clara County, California (Coquillett). Tab. 4.
 Resembles *N. modocorum*.
 Type.—Cat. No. 13186, U.S.N.M.

- cordleyi* COCKERELL, 1903. Corvallis, Oregon (Cordley).
Male 7 mm.; abdomen subclavate.
- cornelliana* COCKERELL, 1908. Ithaca, New York (N. Banks).
A *Gnathias* allied to *N. physura*.
- corvallisensis* COCKERELL, 1903. Corvallis, Oregon, May 24 (Cordley). Tab. 6.
- **crassula* COCKERELL, 1903. Louisiana. Tab. 10.
Resembles *N. modesta*.
Type.—Cat. No. 13171, U.S.N.M.
- **crawfordi* COCKERELL, 1905. Virginia Dale, Colorado (Bishopp). Tab. 1.
Male; Bull. Amer. Mus. Nat. Hist., vol. 22 (1906), p. 438.
- **cressonii* ROBERTSON, 1893. Illinois (Robertson). Tab. 12.
- cressonii trevoriana* COCKERELL, 1905. Olympia, Washington State (Kincaid).
No subdiscal cuneate spot on fourth abdominal segment.
- **crotchii* CRESSON, 1878. Fort Tejon, California (Crotch).
crotchii nigrior COCKERELL, 1903. S. California. Tab. 4.
- **crucis* COCKERELL, 1903. Las Cruces, New Mexico, August (Townsend). Tab. 1, 8, 10.
Closely allied to *N. neomexicana*.
Female; Entomologist, 1907, p. 265.
- crudelis* CRESSON, 1878. Georgia (Morrison).
"This and *grandis* are our largest species" (Cresson, 1878).
- cubensis* CRESSON, 1865. Cuba (Gundlach).
- **cuneata* ROBERTSON, 1903. Illinois. Tab. 1, 9, 12.
Distribution; Proc. Acad. Nat. Sci. Phila., 1903, pp. 601-602.
- cuneata decemnotata* ROBERTSON, 1903. Illinois. Tab. 12.
- **cuneata octonotata* ROBERTSON, 1903. Illinois. Tab. 12.
- **cuneata quadrisignata* ROBERTSON, 1903. Illinois. Tab. 12.
- cuneata sexnotata* ROBERTSON, 1903. Illinois. Tab. 12.
- **custariana* COCKERELL, 1911. West Cliff, Colorado (T. D. A. Cockerell). Subgen. *Gnathias*.
Type.—Cat. No. 14023, U.S.N.M.
- **cymbalariae* COCKERELL, 1906. Near Lake George, Colorado, June 18 (Rohwer).
Probable male (close to *illinoensis*); Entomologist, Dec., 1907, p. 268.
- **daocotana* COCKERELL, 1903. Brookings, South Dakota. Tab. 1, 10, 11.
Also in Colorado and Montana.
- davidsoni* COCKERELL, 1903. S. California. Tab. 4.
- decempunctata* COCKERELL, 1903. S. California. Tab. 4.
- **dentariae* ROBERTSON, 1903. Illinois (Robertson). Tab. 5, 12.
- **denticulata* ROBERTSON, 1902. Illinois (Robertson). Tab. 12.
Formerly confused with *N. articulata*.
- depressa* CRESSON, 1863. Maine.
Female with a depression on fifth dorsal abdominal segment.
Table of species allied to *depressa*; Ent. News, July, 1908, p. 323.
- depressicauda* COCKERELL, 1908. Falls Church, Virginia (N. Banks).
Group of *N. depressa*.
- dilucida* CRESSON, 1878. Colorado (Morrison). Tab. 1.
- ednae* COCKERELL, 1907. Boulder, Colorado, April 10 (Edna Baker).
Superficially much like *N. ornithica*.
- **edwardsii* CRESSON, 1878. California (Henry Edwards). Tab. 4, 5.
Resembles *N. superba*.
- edwardsii australior* COCKERELL, 1903. Los Angeles County, California (Coquillett).
Tab. 4.
- **electa* CRESSON, 1863. Illinois; Connecticut.
Female with sides of face, clypeus, labrum, mandibles, posterior orbits, and a minute spot on each side of ocelli, ferruginous tinged with yellowish; abdomen yellow-banded above, beneath piceous, immaculate. Male with clypeus, etc., yellow.

- electella* COCKERELL, 1903. Georgia.
Anterior coxæ of female spined.
- **elegantula* COCKERELL, 1903. Los Angeles County, California. Tab. 4.
Also occurs at Lewiston, Idaho.
Type.—Cat. No. 13180, U.S.N.M.
- elrodi* COCKERELL, 1903. Montana. Tab. 1, 5.
Also in Nebraska.
- erigeronis* ROBERTSON, 1897. Illinois (Robertson). Tab. 7, 10, 12.
West to Nebraska. See Proc. Acad. Nat. Sci. Phila., 1903, p. 588.
- **erythræa* DALLA TORRE, 1896. Tab. 4.
- **erythrochroa* COCKERELL, 1903. Pasco, Washington, May 25 (Kincaid).
An orange-ferruginous species.
Type.—Cat. No. 13165, U.S.N.M.
- **excellens* COCKERELL, 1903. S. California. Tab. 4.
Variety from Nevada; Proc. Acad. Nat. Sci. Phila., 1903, p. 588.
- excurrentis* COCKERELL, 1903. Southern California. Tab. 4.
Very close to *N. hemphilli*.
- fervida* SMITH, 1854. "St. John's Bluff, East Florida; Georgia (E. Doubleday)."
Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 310.
- festiva* CRESSON, 1863. New Jersey.
Resembles *N. modesta*; abdomen with yellow bands.
- flamivigera* COCKERELL, 1906. North Yakima, Washington, May 15 (E. Jenne).
Female with head and thorax red, with black markings and no yellow; abdomen with a round cream-colored spot on each side of second segment; mandibles simple.
- flaviceps* CRESSON, 1865. Cuba (Gundlach).
- flavipes* PROVANCHER, 1888. Los Angeles, California.
Appears to be near *N. formula*.
- florilega* LOVELL and COCKERELL, 1905.
Female about 8 mm.; allied to *N. sayi*, but larger and darker, the metathorax entirely black.
Visits *Aralia* and *Spiræa*.
- fontis* COCKERELL, 1910. Steamboat Springs, Colorado (Cockerell). Subg. *Nomada* s. str.
- **formula* VIERECK, 1903. San Pedro, California (Cockerell). Tab. 4, 8, 10.
Male; Cockerell, Proc. U. S. Nat. Mus., vol. 39, 1911, p. 658.
- fowleri* COCKERELL, 1903. Corvallis, Oregon, April 15 (Cordley).
Female black and ferruginous; the only yellow about the insect is a small patch at extreme lower corners of face.
- fragilis* CRESSON, 1878. Colorado (Ridings, Morrison). Tab. 1, 8, 11.
- **friesseana* COCKERELL, 1904. Prospect Lake, Colorado Springs, Colorado, May 22 (T. and W. Cockerell).
Resembles *N. rubicunda*.
- **garciana* COCKERELL, 1907. Mesilla Park, New Mexico, May 1 (Cockerell).
Possibly a subspecies of *N. snowi*.
- gibbosa* VIERECK, 1905. Oregon.
Thorax almost entirely black, including scutellum; abdomen with yellow spots; a little yellow at lower corners of face.
- gillettei* COCKERELL, 1905. Golden, Colorado, July 3 (Gillette). Tab. 1.
- **gracilis* CRESSON, 1863. Massachusetts.
Notes on type; Entomologist, 1907, p. 98.
- grænicheri* COCKERELL, 1905.
A *Xanthidium* looking like *N. modesta*; visits *Helianthus* in August.
- grandis* CRESSON, 1875. Colorado (H. C. Yarrow). Tab. 1.

- grayi* COCKERELL, 1903. Corvallis, Oregon, May 7 (Cordley). Tab. 6, 9.
- **grayi eastonensis* COCKERELL, 1903. Easton, Washington. Tab. 9.
Type.—Cat. No. 13163, U.S.N.M.
- **grindeliæ* COCKERELL, 1903. Lincoln, Nebraska, Sept. 2 (Crawford). Tab. 1.
Male black; female with red abdomen.
- gutierrezæ* COCKERELL, 1896. Mesilla Park, New Mexico (Cockerell). Tab. 1.
Type.—Cat. No. 5322, U.S.N.M.
- heiligbrodtii* CRESSON, 1878. Texas (L. Heiligbrodt). Tab. 10.
Allied to *N. modesta*.
- **heleniella* COCKERELL, 1911. Victoria, Texas (J. C. Crawford). Subg. *Melanomada*.
Type.—Cat. No. 13431, U.S.N.M.
- hemphilli* COCKERELL, 1903. S. California. Tab. 4.
- hesperia* COCKERELL, 1903. S. California. Tab. 4.
- hoodiana* COCKERELL, 1903. Mount Hood, Oregon.
- illinoensis* ROBERTSON, 1900. Illinois (Robertson). Tab. 12.
Was confused with *N. sayi*; abdomen of female nearly always 5- or 6- spotted.
- imbricata* SMITH, 1854. "United States."
Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 310.
- **incerta* CRESSON, 1863. "Conn., N. J., Pa., Md., Ills."
Female abdomen ferruginous, immaculate.
Same as *N. articulata*.
- infantula* COCKERELL, 1907. Great Falls, Virginia, May 22 (N. Banks).
A very small species, about 5 mm. long.
- integerrima* DALLA TORRE, 1896.
Apex of male abdomen entire.
- integra* ROBERTSON, 1893. Illinois (Robertson). Tab. 12. (*Phor integer*).
Name preoccupied; = *integerrima*.
- intercepta* SMITH, 1879. Vancouver Island.
Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 312.
- interrupta* FOWLER, 1899. Berkeley, California (H. O. Woodworth).
Name preoccupied; = *interruptella*.
- interruptella* FOWLER, 1902.
- itamera* COCKERELL, 1910. Pullman, Washington (W. M. Mann). Subg. *Nomada*
s. str.
- jenei* COCKERELL, 1906. N. Yakima, Washington, Sept. 26 (E. Jenne).
Although the anterior coxæ are not spined, they have minute red tubercles.
Probably nearest to *N. pascoensis*, which is quite differently colored.
- jocularis* CRESSON, 1879. Nevada (Morrison).
- kincaidiana* COCKERELL, 1903. Washington.
- krugii* CRESSON, 1878. Porto Rico (Leopold Krug).
- lamarensis* COCKERELL, 1905. Lamar, Colorado. (E. D. Ball). Tab. 1.
- **latifrons* COCKERELL, 1903. Santa Cruz Mountains, California. Tab. 4.
Variety from Nevada; Proc. Acad. Nat. Sci. Phila., 1903, p. 588.
Type.—Cat. No. 13155, U.S.N.M.
- **lehighensis* COCKERELL, 1903. Lehigh Gap, Pennsylvania. (Viereck).
Paratype.—Cat. No. 13831, U.S.N.M.
- **lepida* CRESSON, 1863. Pikes Peak, Colorado; Rock Island, Illinois. Tab. 1, 9, 11.
Subgenus *Gnathias*.
New description; Proc. Acad. Nat. Sci. Phila., 1903, p. 596.
- **lewisi* COCKERELL, 1903. Corvallis, Oregon, May and June (Cordley). Tab. 6.
Paratype.—Cat. No. 13188, U.S.N.M.
- **libata* CRESSON, 1878. Colorado (Ridings). Tab. 1.
For characters see Cockerell, Proc. U. S. Nat. Mus., vol. 39, 1911, p. 648.
- limata* CRESSON, 1878. Mexico (Sumichrast).
Resembles the Cuban *N. tibialis*. Also in Texas.

lippiæ COCKERELL, 1903. La Cueva, Organ Mountains, New Mexico (Townsend).
Tab. 1, 8, 10.

Visits *Lippia* in September.

lippiæ sublippiæ COCKERELL, 1907. Las Cruces, New Mexico, Sept. 15 (Cockerell).
Male with clypeus black; no supraclypeal mark; lateral face-marks narrower above.

**louisianæ* COCKERELL, 1903. Louisiana. Tab. 9.

Allied to *N. cuneata*.

Type.—Cat. No. 13166, U.S.N.M.

**luteola* OLIVIER, 1811. Carolina. Tab. 5, 12.

**luteola bishoppi* COCKERELL, 1911. Dallas, Texas (Bishop). Subg. *Xanthidium*.
Type.—Cat. No. 13435, U.S.N.M.

**luteoloides* ROBERTSON, 1895. Illinois (Robertson). Tab. 5, 12.

Allied to *N. luteola*.

luteopicta COCKERELL, 1905. Palisades, Colorado (Gillette). Tab. 1.

**maculata* CRESSON, 1863. Connecticut.

Female of *N. bella*.

magnifica COCKERELL, 1903. Colorado. Tab. 1.

Perhaps a variety of *N. grandis*.

malonella COCKERELL, 1910. Wawawai, Wash. (W. M. Mann). Subg. *Nomada* s. str.

malonina COCKERELL, 1910. Wawawai, Wash. (W. M. Mann). Subg. *Nomada* s. str.

**marginella* COCKERELL, 1903. S. California. Tab. 4.

**martinella* COCKERELL, 1903. Mesilla Park, New Mexico, April (Cockerell). Tab. 1,
10, 11.

Male; Bull. 94, Colorado Agric. Exper. Sta., p. 76. Also in Colorado.

Type.—Cat. No. 13156, U.S.N.M.

melliventris CRESSON, 1878. California (Henry Edwards).

**mera* COCKERELL, 1908. Salina, Colorado (W. P. Cockerell).

Allied to *N. cressonii*; a variety occurs in New Jersey.

mexicana CRESSON, 1878. Mexico (Sumichrast).

mimula COCKERELL, 1908. Falls Church, Virginia (N. Banks).

Resembles *N. modesta*.

miniata SMITH, 1854. Georgia.

Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 311.

**mittelli* COCKERELL, 1911. Victoria, Texas (J. D. Mitchell). Subg. *Micronomada*.

Type.—Cat. No. 13433, U.S.N.M.

**modesta* CRESSON, 1863. Maine; Rock Island, Illinois. Tab. 10.

modesta rivertonensis COCKERELL, 1903. Riverton, New Jersey (Viereck). Tab. 10.

modocorum COCKERELL, 1903. Corvallis, Oregon (Cordley).

montezumia SMITH, 1879. Orizaba, Mexico.

Notes on type; Trans. Am. Ent. Soc., vol. 31, p. 312.

**morrisoni* CRESSON, 1878. Colorado (H. K. Morrison). Tab. 1, 5.

**morrisoni flagellaris* COCKERELL, 1903. Colorado (Morrison). Tab. 1, 5.

Type.—Cat. No. 13172, U.S.N.M.

munda CRESSON, 1878. Colorado (Ridings). Tab. 1.

Female with clypeus and tegulæ ferruginous.

mutans COCKERELL, 1910. Pullman, Washington (W. M. Mann). Subg. *Holonomada*.

**neomexicana* COCKERELL, 1903. Deming, New Mexico, July (Cockerell). Tab. 1,
8, 10.

Perhaps a subspecies of *texana*.

Type.—Cat. No. 13157, U.S.N.M.

nigrocincta SMITH, 1879. Arctic America. Tab. 6.

Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 311.

obliqua FOWLER, 1899. Berkeley, California (H. O. Woodworth).

Name preoccupied; = *obliquella*.

obliquella FOWLER, 1902.

**obliterata* CRESSON, 1863. District of Columbia. Tab. 1, 12. (*Heminomada obliterated*.)

obscura FOWLER, 1899. Berkeley, California (Fowler).

Name preoccupied; = *obscurella*.

obscurella FOWLER, 1902.

opposita CRESSON, 1878. California (Henry Edwards).

orcusella COCKERELL, 1910. Orcas Island, Washington (W. M. Mann). Subg. *Nornada* s. str.

**oregonica* COCKERELL, 1903. Corvallis, Oregon, April to June (Cordley). Tab. 4, 6. Ranges to S. California. Similar to *N. sayi*.

Paratype.—Cat. No. 13191, U.S.N.M.

ornithica COCKERELL, 1906. Boulder, Colorado (W. P. Cockerell). Tab. 11.

**osborni* COCKERELL, 1911. Tucson, Arizona (H. Osborn). Subgen. *Nomada* s. str.

Type.—Cat. No. 14025, U.S.N.M.

ovata ROBERTSON, 1903. Illinois (Robertson). Tab. 9, 12.

ovata binotata ROBERTSON, 1903. Illinois. Tab. 12.

ovata octomaculata ROBERTSON, 1903. Illinois. Tab. 12.

ovata plena ROBERTSON, 1903. Illinois. Tab. 12.

ovata quadrimaculata ROBERTSON, 1903. Illinois. Tab. 12.

ovata sexmaculata ROBERTSON, 1903. Illinois. Tab. 12.

ovata unicolor ROBERTSON, 1903. Illinois. Tab. 12.

pacata CRESSON, 1878. Colorado (Ridings).

Same as *N. accepta*. See Ann. Mag. Nat. Hist., Oct., 1903. p. 447.

packardella COCKERELL, 1906. Boulder, Colorado, June 11 (W. P. Cockerell). Tab. 11.

Allied to *N. nigrocincta*.

pallidella COCKERELL, 1905. Montrose, Colorado (Gillette). Tab. 1, 2.

parata CRESSON, 1878. Colorado (Ridings). Tab. 1.

Allied to *N. libata*, but tegulae polished, with a few scattered punctures (in *libata* coarsely sculptured and opaque).

**parva* ROBERTSON, 1900. Illinois (Robertson). Tab. 12.

Confused with *N. sayi*; female abdomen 8-spotted.

**pascoensis* COCKERELL, 1903. Pasco, Washington State, May 25 (Kincaid). Tab. 4, 5.

A variety occurs in Los Angeles County, California.

Type.—Cat. No. 13187, U.S.N.M.

**pecosensis* COCKERELL, 1903. Pecos, New Mexico, June 26 (W. P. Cockerell). Tab. 1, 5.

Described as a variety of *N. xanthophila*.

Type.—Cat. No. 13185, U.S.N.M.

pennigera COCKERELL, 1894. Mesilla Valley, New Mexico. Tab. 1.

**perbella* VIERECK, 1905. Corvallis, Oregon (Cordley). Subg. *Gnathias*.

Closely related to *N. bella*. Also in British Columbia.

Paratype.—Cat. No. 13330, U.S.N.M.

perivincta COCKERELL, 1905. Colorado. Tab. 1.

**perivincta* COCKERELL, var. B. COCKERELL, 1911. Colorado.

perivincta semirufula COCKERELL, 1905. Colorado. Tab. 1.

**perplexa* CRESSON, 1863. "Mass., Conn., Pa., Del." Tab. 9. Subgenus *Gnathias*.

perplexans COCKERELL, 1910. Pullman, Washington (W. M. Mann). Subg. *Gnathias*.

physura COCKERELL, 1903. Nevada. Tab. 9.

**pilosula* CRESSON, 1878. New York.

Belongs to the genus *Viereckella*.

Plummers Island, Maryland, July 5, 1909 (J. C. Crawford).

**placida* CRESSON, 1863. Pennsylvania. Tab. 12.

**placitensis* COCKERELL, 1903. Placita, New Mexico, May (Cockerell). Tab. 1.

Female about 10 mm.

Type.—Cat. No. 13176, U.S.N.M.

provancheri DALLA TORRE, 1896.

proxima CRESSON, 1863. Maine.

Allied to *N. vicina*.

pseudops COCKERELL, 1905. Milwaukee, Wisconsin (Graenicher).

Female about 9 mm.; red, with black and yellow markings. Looks much like *N. coloradensis*.

pulchella SMITH, 1854. "North America."

**pulsatillæ* COCKERELL, 1906. Boulder, Colorado, April 20 (Cockerell). Tab. 11.

Female red and black, with no yellow anywhere.

punctata = *provancheri* DALLA TORRE.

A Canadian species has been cited as *punctata* Fabricius, but there is no species of this name described by Fabricius; *N. punctata* Lepeletier is Algerian. Provancher says the scutellum has a spine on each side. Dalla Torre renames this *provancheri*.

putnami CRESSON, 1876. Spring Lake, Utah (J. D. Putnam). Tab. 10.

**pygmxæa* CRESSON, 1863. Connecticut.

Male with clypeus, a spot above it, labrum, mandibles, and face narrowly on each side of clypeus, yellow; orbits ferruginous. Viereck examined Cresson's type and found mandibles simple.

rhodalis COCKERELL, 1903. Nevada. Tab. 9.

rhodomelas COCKERELL, 1903. Corvallis, Oregon (Cordley). Tab. 9.

**rhodosoma* COCKERELL, 1903. Santa Cruz Mountains, California. Tab. 4.

Close to *N. erythræa*.

Type.—Cat. No. 13167, U.S.N.M.

**rhodosoma rhodosomella* COCKERELL, 1903. Colorado (Morrison).

Type.—Cat. No. 13161, U.S.N.M.

rhodotricha COCKERELL, 1903. S. California. Tab. 4.

Thorax with bright ferruginous hair.

rhodoxantha COCKERELL, 1905. Colorado.

ridingsii CRESSON, 1878. Colorado (J. Ridings). Tab. 1, 10.

Allied to *N. putnami*.

**rivalis* CRESSON, 1878. California (H. Edwards, Behrens). Tab. 5.

For characters see Cockerell, Proc. U. S. Nat. Mus., vol. 39, 1911, p. 651.

robertsonella COCKERELL, 1903. Nevada.

Resembles *N. erythræa*.

**rohweri* COCKERELL, 1906. Near Lake George, Colorado, June 18 (Rohwer).

Allied to *N. snowi*.

rubicunda OLIVER, 1811. Carolina. Tab. 10.

rubra PROVANCHER, 1888. Los Angeles, California.

Name preoccupied; = *erythræa*.

rubrella COCKERELL, 1905. Fort Collins, Colorado (Mrs. Laura Titus). Tab. 1.

Subgenus *Gnathias*.

**rubrica* PROVANCHER, 1896. Los Angeles, California (Coquillett). Tab. 4.

Variety: Proc. Acad. Nat. Sci. Phila., 1903, p. 570.

**ruficornis* LINNÆUS, 1758. Europe.

Supposed *ruficornis* in Maryland; Proc. Acad. Nat. Sci. Phila., 1903, p. 614.

**ruidosensis* COCKERELL, 1903. Ruidoso Creek, New Mexico (Wootton). Tab. 1.

Variation: Bull. Amer. Mus. Nat. Hist., vol. 22 (1906), p. 438. Also in Colorado.

Type.—Cat. No. 13175, U.S.N.M.

salicis ROBERTSON, 1900. Illinois (Robertson) Tab. 2, 12.

**sanctæcrucis* COCKERELL, 1903. Santa Cruz Mountains, California. Tab. 4, 5.

Type.—Cat. No. 13179, U.S.N.M.

**sayi* ROBERTSON, 1893. Illinois. Tab. 1, 12.

New description: Canad. Ent., 1900, p. 293.

Distribution: Proc. Acad. Nat. Sci. Phila., 1903, p. 605.

- **schwarzi* COCKERELL, 1903. Veta Pass, Colorado, June 28. Tab. 1, 9. Subg. *Gnathias*.
Allied to *N. bella* and *cuneata*.
Type.—Cat. No. 13164, U.S.N.M.
- **schwarzi contractula* COCKERELL, 1903. Beulah, New Mexico (Cockerell). Tab. 1, 9. Subg. *Gnathias*.
Type.—Cat. No. 13134, U.S.N.M.
- **scita* CRESSON, 1878. Colorado (Morrison). Tab. 7, 8, 10.
Related to *N. articulata*.
- **scitiformis* COCKERELL, 1903. Corvallis, Oregon, June (Cordley). Tab. 7, 10.
Paratype.—Cat. No. 13160, U.S.N.M.
- **semiscita* COCKERELL, 1904. Prospect Lake, Colorado Springs, Colorado, May 22 (T. and W. Cockerell).
Allied to *N. scitiformis*.
- **semisuavis* COCKERELL, 1910. Wawawi, Washington (W. M. Mann). Subg. *Micro-nomada*.
Female: Cockerell, Proc. U. S. Nat. Mus., vol. 39, 1911, p. 658. Also in California
- **sidæfloris* COCKERELL, 1898. Mesilla, New Mexico (Cockerell). Tab. 1.
Described as a variety of *N. pennigera*.
Type.—Cat. No. 5821, U.S.N.M.
- simplex* ROBERTSON, 1902. Illinois. Tab. 2, 12.
In 1897 Robertson recorded this as the female of *N. bella*.
- skinneri* COCKERELL, 1908. Lehigh Gap, Pennsylvania, June 30 (Viereck).
Group of *N. depressa*.
- **snowii* CRESSON, 1878. Colorado (F. H. Snow, Morrison). Tab. 1, 10.
Female with clypeus ferruginous, lateral face-marks white.
- **sophiarum* COCKERELL, 1903. Mesilla Park, New Mexico, April 16 (Cockerell).
Tab. 1, 8, 10.
Type.—Cat. No. 13182, U.S.N.M.
- sphærogaster* COCKERELL, 1903. Riverton, New Jersey, April (Viereck).
- **suavis* CRESSON, 1878. "California (*Behrens*); Oregon (H. Edwards)." Tab. 8.
- **subaccepta* COCKERELL, 1907. Florissant, Colorado (Rohwer). Subg. *Gnathias*.
In Tab. 1 runs to *N. vicinalis*, but differs (male) by its smaller size, base of metathorax with distinct though delicate longitudinal ridges, absence of yellow on first abdominal segment, etc.
Paratype.—Cat. No. 13667, U.S.N.M.
- **subangusta* COCKERELL, 1903. S. California. Tab. 4.
Type.—Cat. No. 13163, U.S.N.M.
- subgracilis* COCKERELL, 1903. California. Tab. 4.
Belongs to subgenus *Phor*.
- subrutula* LOVELL and COCKERELL, 1905. Maine (Lovell). Tab. 11.
Also in Colorado. See Ann. and Mag. Nat. Hist., July, 1906, p. 69.
- **subsimitis* COCKERELL, 1903. Los Angeles County, California, Feb. (Coquillett).
Tab. 4.
Perhaps a subspecies of *N. civilis*.
Type.—Cat. No. 13178, U.S.N.M.
- **subvicinalis* COCKERELL, 1903. S. California. Tab. 4.
Type.—Cat. No. 13169, U.S.N.M.
- suda* CRESSON, 1879. Nevada (Morrison).
- sulphurata* SMITH, 1854. Georgia. Tab. 5.
Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 311.
- **superba* CRESSON, 1863. Pike's Peak, Colorado. Tab. 1, 12.
- **tarazacella* COCKERELL, 1903. Placita, New Mexico (Cockerell). Tab. 1.
Allied to *N. ultima*.

- **texana* CRESSON, 1872. Texas (Belfrage; Boll.) Tab. 10.
Type.—Cat. No. 1762, U.S.N.M.
- tibialis* CRESSON, 1865. Cuba (Poey).
- tiftonensis* COCKERELL, 1903. Tifton, Georgia. Tab. 10.
 Allied to *N. modesta*.
- **tintinnabulum* COCKERELL, 1903. Santa Cruz Mountains, California. Tab. 4.
Type.—Cat. No. 13177, U.S.N.M.
- torrida* SMITH, 1854. Georgia.
 Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 310.
- truttarum* COCKERELL, 1909. Trout Spring, Gallinas Canyon, New Mexico, May (Cockerell).
 In Tab. 1 runs to *N. vicinalis*, from which it (male) differs by the large lateral face-marks, first abdominal segment without yellow, etc.
- uhleri* COCKERELL, 1905. Fort Collins, Colorado (Titus). Tab. 1.
- ultima* COCKERELL, 1903. Corvallis, Oregon (Cordley). Tab. 6.
 Also in California, at Palo Alto.
- ultimella* COCKERELL, 1903. S. California. Tab. 4.
 Similar to *N. erythræa* and *N. ultima*.
- undulaticornis* COCKERELL, 1906. Boulder, Colorado, April 20 (W. P. Cockerell).
 Male in Tab. 1 runs to 62, but runs out because of the rather smaller size and red on scutellum.
- **valida* SMITH, 1854. Nova Scotia.
 Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 310.
- vallesina* COCKERELL, 1906. Las Valles, New Mexico, April 20 (Cockerell).
 Female 8½ mm.; head, thorax, and legs bright ferruginous, without yellow, except that the postscutellum is a sort of dull orange (black at extreme sides), but there are black markings; abdomen with broad lemon-yellow bands. Visits wild plum.
- **vegana* COCKERELL, 1903. Las Vegas, New Mexico (A. Garlick). Tab. 1, 8, 10.
 Very close to *N. modesta*; clypeus of female ferruginous.
- vegana nitescens* COCKERELL, 1905. Fort Collins, Colorado (Titus). Tab. 1.
- **verecunda* CRESSON, 1879. Nevada (Morrison). Tab. 8.
 "Easily recognized by the black annulus on posterior tibiae and immaculate meta-thorax" (Cresson).
- vespiformis* FÖRSTER, 1771. "North America; Europe."
 A species not recognized by modern writers.
- **vezator* COCKERELL, 1909. Troublesome, Colorado, June (Rohwer).
Paratype.—Cat. No. 12285, U.S.N.M.
- viburni* ROBERTSON, 1897. Illinois (Robertson).
 Only two submarginal cells.
 Same as *N. obliterata*.
- **vicina* CRESSON, 1863. "Connecticut; New York."
vicinalis CRESSON, 1878. Colorado (Morrison). Tab. 1, 3.
 Related to *N. civilis*.
- vicinalis aldrichi* COCKERELL, 1910. Moscow, Idaho.
- vicinalis infrarubens* COCKERELL, 1905. Corvallis, Oregon (Cordley). Tab. 3.
- **victrix* COCKERELL, 1911. Victoria, Texas (A. J. Leister). Has only two submarginal cells.
Type.—Cat. No. 13436, U.S.N.M.
- **vierecki* COCKERELL, 1903. Juarez, Mexico, May 12 (Cockerell). Tab. 1, 8, 10.
 Also in Mesilla Valley, New Mexico.
Type.—Cat. No. 13162, U.S.N.M.
- **vineta* SAY, 1837. Indiana (Say). Tab. 1, 5, 12.
- vinnula* CRESSON, 1879. Nevada (Morrison).

viticollis CRESSON, 1878. Mexico (Sumichrast).

Female mesothorax black, with four longitudinal yellow lines.

volatilis SMITH, 1879. Canada.

Notes on type; Trans. Amer. Ent. Soc., vol. 31, p. 312. Subg. *Gnathias*.

washingtoni COCKERELL, 1903. Washington State. Tab. 9.

**wheeleri* COCKERELL, 1903. Texas (Belgrave). Tab. 10.

Type.—Cat. No. 13170, U.S.N.M.

**wheeleri engelmanniæ* COCKERELL, 1911. Dallas, Texas (W. S. Pierce).

Also in Kansas.

Type.—Cat. No. 13432, U.S.N.M.

wootonella COCKERELL, 1909. Mesilla Park, New Mexico (Cockerell).

Visits *Sophia* in April. Allied to *N. sayi*.

**xantholepis* COCKERELL, 1911. Los Pinos, Colorado (Carl F. Baker).

Type.—Cat. No. 14022, U.S.N.M.

xanthophila COCKERELL, 1900. Las Vegas, New Mexico (W. Porter). Tab. 1.

Resembles *N. superba*.

xanthura COCKERELL, 1908. Sea Cliff, Long Island, New York (N. Banks).

Allied to *N. denticulata*.

**zebrata* CRESSON, 1878. "Colorado; Kansas (Ridings)." Tab. 1, 5.

"The male of this species is readily distinguished by the short dilated scape" (Cresson).

ADDITIONAL NOTES ON BEES OF THE GENUS *NOMADA*.

[The material discussed below is in the U. S. National Museum.]

SPECIES FROM COLORADO.

NOMADA (*XANTHIDIUM*) *PERIVINCTA* Cockerell, var. b.

Female.—Length fully 11 mm.; first abdominal segment broad; mandibles yellow, piceous at apex; clypeus all yellow; posterior orbital margins largely yellow; third and fourth antennal joints the same light red, third much shorter than fourth; black disk of mesothorax with two broad red bands; scutellum strongly bilobed; patch on lower part of pleura all red; legs with much yellow, the general effect being yellow flushed with red, the hind femora and tibiæ largely black behind; tegulæ yellow, suffused with red posteriorly; apices of first four abdominal segments with reddish-black bands; first ventral segment red, with a trilobed yellow mark; bases of third to fifth segments rufopiceous; third s. m. very broad below, greatly narrowed above; b. n. going a little basad of t. m. Differs from *N. sulphurata* Smith by having third antennal joint the same color as fourth; stripes on disk of mesothorax red and broad (yellow and narrow in *sulphurata*); and the greater amount of yellow on abdomen. Differs from *N. citrina* Cresson by the absence of black on the anterior and middle legs (though the middle tibiæ have a fuscous patch behind), and the large amount of red on legs; the square face; etc.

One from the Baker collection, labeled "Colo. 2075." *N. perivincta* was based on a single specimen in the collection of the Colorado Agricultural College, simply marked "Colorado." Another specimen in the same collection, also marked "Colorado," differed so much that

it was described as a variety *semirufula*. The present insect represents another variety, more approaching *N. sulphurata*, but it does not seem worth while to give it a special name. It seems that *sulphurata* of the Eastern States, *perivincta* of the Rocky Mountains, and *citrina* of the California region are very closely allied, and possibly only subspecifically distinct. They are all confusingly variable.

NOMADA ACCEPTA Cresson.

A male in Baker's collection labeled "Colo. 1160" was marked *accepta* by Baker, but someone crossed this out. It differs from Cresson's description of male *accepta* as follows: Upper half of labrum and base of mandibles broadly, cream-color; tubercles with a large cream-colored spot; pleural patch red with a large transverse cream-colored mark. I possess only the female of *N. accepta*, but after careful comparisons I feel assured that the male is correctly referred to it, the various differences noted being due to variation. In my table of Rocky Mountain *Nomada*¹ this runs to the same place as the female. The mesothorax and metathorax are entirely black.

NOMADA (MICRONOMADA) VEGANA Cockerell.

Six from the Baker collection from Colorado, with numbers 1591, 2325, 2096, 2098, 1081.

NOMADA CIVILIS Cresson.

A male from West Cliff, Colorado (Cockerell); marked *fragilis* by Ashmead, and recorded as such.²

NOMADA FRAGILIS Cresson.

Several males from Fort Collins, Colorado, 1905, collector unknown; one from Baker, labeled "Colo. 2212."

NOMADA (NOMADULA) ARTICULATA DACOTANA Cockerell.

Males; Colorado (Baker 2076); Denver, Colorado, May 23, 1898 (collector not given).

NOMADA (NOMADULA) MARTINELLA Cockerell.

Male: Berkeley, Colorado, May 18, 1898 (collector unknown).

NOMADA (NOMADULA) FRIESEANA Cockerell.

Male.—Length 10 mm.; superficially like *N. articulata dacotana*, with the same red, yellow-banded abdomen, but the light band on first segment with a spot on each side, and the apical plate entire; it is easily distinguished by the antennæ, which are thick, with the fourth joint much shorter, the fifth with a prominent sharp spine; the tegulæ

¹Bull. 94, Colorado Agric. Exper. Station.

²Trans. Amer. Ent. Soc., vol. 20, p. 339.

are yellow. Compared with *N. semiscita* this is larger and more robust, with the ground-color of the first three abdominal segments bright ferruginous, the postscutellum yellow or orange, and very obscure light spots on the axillæ and near the posterior corners of the scutellum. The first r. n. joins the second s. m. in the middle, and the eyes are olive-green. Venter of abdomen clear ferruginous, sparingly marked with yellowish; lateral face-marks rather irregular, but gradually narrowing above, to end in a line which nearly reaches the top of the eye; hind femora blackened behind, but in front only at base.

Berkeley, Colorado, June 10, 1897 (collector unknown). I was about to describe this as new, but on close comparison with *N. frieseana* female, I am convinced that it is the hitherto unknown male of that species.

NOMADA TEXANA Cresson.

Two females: Colorado (Baker 2095). The yellow markings are paler than usual.

NOMADA TARAXACELLA Cockerell.

Four females: Colorado (Baker 2075). One is quite normal, except that the face is broad; the other three lack the yellow markings at the sides of the abdomen, and the lower corners of the face, though a little pallid, are scarcely yellow. After careful comparison, I am convinced that they are all one species. Eight males, also with Baker's No. 2075, are, I think, certainly to be associated with them. These males, however, can not be easily separated from *N. modocorum* Cockerell. *N. taraxacella* was originally described as a subspecies of *N. ultima* Cockerell. The types of *N. ultima* and *modocorum* both came from Corvallis, Oregon, and I now believe they are the sexes of one species. The Rocky Mountain *taraxacella* is readily separable in the female, but the male is like that of *modocorum*, except that the hair on inner side of hind basitarsus is pale fulvous, and the third antennal joint is relatively shorter. The yellow bands along sides of face may be swollen at the upper end. The scutellum varies as follows: (1) All black, (2) with two minute red spots, (3) with two large red spots, slightly confluent, (4) with two small yellow spots.

Two female *taraxacella* are labeled "Colo. 2179," from the Baker collection.

NOMADA SAYI Robertson.

Females: Colorado (Baker 1893); Westcliffe, Colorado, at flowers of *Erigeron radicans*, May 24, 1889 (T. D. A., Cockerell, 34). The last was reported in the Wet Mountain Valley list as *N. americana* var. *valida*. These are best distinguished from *N. taraxacella* by the smooth shining abdomen, without the satiny, almost purplish

luster of *taraxacella*, and the longer third antennal joint. The Rocky Mountain *sayi* is not quite typical; it may prove to grade into the Pacific coast *N. oregonica* Cockerell.

NOMADA MERA Cockerell.

Two females (Baker 2075 and 2212) and one male (Baker 2075) from Colorado. The male, which has not been described, has the following characters: Length about 8 mm.; head and thorax with much white silky hair; clypeus, supraclypeal mark (broader than long), lateral face-marks (filling space between clypeus and eye, except a dark stripe along sides of upper part of clypeus, narrowing above antennæ, and passing into a red band which reaches top of eye), labrum, mandibles (except the ferruginous apical part), and front of the thick scape, all *pale yellow*; flagellum bright ferruginous, the basal half black above; third antennal joint about half as long as fourth; mesothorax dark red with a broad median black band, and black lateral margins; scutellum nearly all bright red; sides of metathorax with much white hair; metathorax all black; pleura with a small obscure red spot; tubercles yellowish red; upper border of prothorax red; tegulæ light yellowish testaceous; legs bright ferruginous, without yellow; hind femora strongly blackened beneath; hind basitarsus with a dark streak; abdomen colored and marked practically as in female; apical plate strongly notched. In Robertson's table¹ this runs nearest to *N. cressonii* Robertson. The female is easily separated from *N. cymbalarizæ* Cockerell by the abundant white hair at the sides of the metathorax.

Female *N. mera* was also taken at Boulder Falls, Boulder County, Colorado, May 23, 1908 (Hite).

NOMADA CRAWFORDI Cockerell.

Berkeley, Colorado, female, June 10, 1897 (collector unknown). In 1907 Mr. S. A. Rohwer took this species at flowers of *Antennaria microphylla*, Florissant, Colorado, June 15, two males; and at flowers of *Drymocallis fissa*, Topaz Butte, Colorado, June 23.

NOMADA XANTHOLEPIS, new species.

Male.—Length 11½ mm. or rather more, anterior wing nearly 9 mm.; black and yellow, the legs red and yellow, pubescence a rather sordid white; head broad, facial quadrangle broader than long; eyes pale greenish-gray; labrum, mandibles except apex, sides of face, clypeus and nearly square supraclypeal mark, all bright yellow; a small dark spot on each side of clypeus, contiguous with a round spot beyond the suture; a black band along each side of supraclypeal mark and upper part of clypeus, the broad lateral areas otherwise all yellow,

¹Canadian Entomologist, June, 1903.

the yellow ending in a point, away from the orbit, a short distance above the antennæ; lower half of posterior orbital margins broadly yellow; scape thick, very broadly yellow in front; flagellum long (reaching postscutellum) and thick but normal, black above except at apex, broadly bright ferruginous beneath; third antennal joint much shorter than fourth; mesothorax black, densely and coarsely punctured; metathorax all black; upper border of prothorax, tubercles and coarsely punctured tegulæ, bright yellow; scutellum bigibbous, with two very large contiguous round patches, ferruginous suffused with yellow; postscutellum with a short band of the same color; pleura with a broad angular (rather L-shaped) yellow patch in front, a reddish-yellow spot near the middle of the upper part, and a small spot near the lower end posteriorly; legs red marked with yellow, and with the anterior tibiæ in front, and the outer side of the hind basitarsi, all yellow; wings strongly yellowish, dusky at apex; b. n. a little basad of t. m.; second s. m. broad below, receiving first r. n. about middle; stigma and nervures clear ferruginous; abdomen broad, bright yellow, basal half of first segment black, and a triangular red lobe projecting from the black in the middle, reaching the middle of the yellow band; hind margins of segments reddish subhyaline, and extreme bases black; apical plate large, shallowly emarginate; venter yellow, only the basal part darkened.

Habitat.—Los Pinos, Colorado, at flowers of *Erigeron*, May 22, 1899 (Carl F. Baker).

Type.—Cat. No. 14022, U.S.N.M.

In my table of Rocky Mountain *Nomada* this runs to 47, differing from *N. superba* by the notched apical plate. The following table brings out its relationships with the species running to the same point in the 1903 table:

Large and robust; metathorax with an obtuse projecting angle on each side; postscutellum all black; hind margins of abdominal segments black (male).

	<i>superba</i> Cresson.
Smaller; metathorax without such angles.....	2
2. Outer nervures dark fuscous; first r. n. joining second s. m. far beyond middle; scutellum with large yellow spots; postscutellum with a yellow band; hind margins of first four abdominal segments black (female).....	<i>mimula</i> Cockerell.
Outer nervures ferruginous or light brown: first r. n. usually joining second s. m. about middle (beyond in <i>crawfordi</i>)	3
3. Legs red, strongly marked with yellow; postscutellum with a light mark; lateral face-marks very broad above.....	<i>xantholepis</i> Cockerell.
Legs red, not or hardly at all marked with yellow; postscutellum all black	4
4. Lateral face-marks broad above.....	<i>crawfordi</i> Cockerell.
Lateral face-marks narrow above.....	<i>ednæ</i> Cockerell.

N. xantholepis is a typical member of the subgenus *Xanthidium* Robertson. Superficially, it looks very much like *N. civilis* Cresson. In the table¹ it runs out next to *N. sanctæcrucis* Cockerell.

¹ Proc. Acad. Nat. Sci. Phila., 1903, p. 580.

NOMADA (*GNATHIAS*) *BELLA* Cresson.

Females: Bear Creek, Colorado, July 7, 1897 (collector unknown); Colorado (Baker 884).

NOMADA (*GNATHIAS*) *CUSTERIANA*, new species.

Male.—Length a little over 6 mm.; head and thorax black, rugosopunctate, with long white hair, dense and silvery on face; head transversely oval; eyes pale greenish-grey, their distance below at least as great as the length of an eye; mandibles ferruginous, strongly bidentate at end; the linear malar space also ferruginous, but tegument of labrum, clypeus, and all the rest of head entirely black; antennæ reaching base of metathorax; scape black; flagellum bright ferruginous, the upper surface black above and flattish on the basal half, on the apical half not quite so dark, though strongly infuscated; third antennal joint much shorter than fourth, fourth about as long as last; thorax entirely black; tegulæ large, punctured, rufopiceous; stigma and nervures ferruginous; b. n. going only a very little basad of t. m. (unusual venation for a *Gnathias*); second s. m. broad, receiving first r. n. about middle; third s. m. extremely broad, but narrowed to about a fifth of its length above; legs black basally, with the knees broadly, the tibiæ and tarsi chestnut red; anterior and middle tibiæ with a dusky suffused patch on outer side; abdomen dark red. The first segment black at base, the black gradually melting into the red; segments 2 to 6 with cream-colored bands, on 2 very broad, interrupted by red in middle, on 3 narrower, also interrupted by red, on 4 with a linear median interruption, but a very broad one on each side, on 5 and 6 continuous in the middle, but failing laterally; apical plate long, notched; venter chestnut red, nude, except for a large apical tuft of hair.

Habitat.—West Cliff, Colorado (T. D. A. Cockerell). Labeled by Doctor Ashmead *Nomada pacata* Cresson, a species to which it is not allied, although the markings of the abdomen are very like those of *pacata*. Among the small species of *Gnathias* it will be readily known by its wholly dark face and the venation.

Type.—Cat. No. 14023, U.S.N.M.

In the Transactions of the American Entomological Society,¹ *N. parata* Cresson is recorded from West Cliff, but not *pacata*. I am practically certain that *N. custeriana* is one of the specimens captured May 19, 1889, of which I have a note that the size was small and the thorax black. This was determined at the time by Doctor Ashmead as *N. parata*, and was the basis of the record just cited.

The specimens labeled "West Cliff, Col." in the U. S. National Museum, from the Ashmead collection, are all of my collecting, though this is not stated on the labels. So far as the aculeate Hymen-

¹Vol. 20, p. 339.

optera are concerned, I fear the Wet Mountain Valley list in the Transactions of the American Entomological Society¹ must be considered very unreliable, but the records can be checked with the specimens in the National Museum.

SPECIES FROM ARIZONA.

NOMADA TEXANA Cresson.

Eight males and three females from the Baker collection, labeled Arizona, with Nos. 2122 and 2123.

NOMADA (XANTHIDIUM) ARIZONICA, new species.

Male.—Length 9 mm. or rather more; yellow, black, and red, with scanty white pubescence; eyes pale green; facial quadrangle about square; face below antennæ all lemon yellow, except that it is slightly suffused with red above, and there is a dusky band down each side of supraclypeal area and halfway down margin of clypeus; lateral face-marks ending broadly but suffusedly a little above level of antennæ; a pale red posterior orbital band, extending over top of eye, its lowermost part changing to yellow; labrum yellow; mandibles yellow at base, red in middle, dark at apex; scape stout, bright yellow, with a black band behind; flagellum blackened above, except the first joint, beneath clear ferruginous, with the last three joints dusky; third antennal joint hardly over half length of fourth; mesothorax densely rugosopunctate, black with red lateral suffusion and sublateral bands, the axillæ also red; scutellum and postscutellum bright yellow; upper border of prothorax and tubercles yellow; pleura with a very broad yellow band, having an upward broad extension in front; above and below this band it is red, but black just below the wings; metathorax broadly black in middle, with a broad red band on each side, invading inclosure, and having on its lower part a large yellow spot; tegulæ bright ferruginous; wings clear hyaline, dusky at apex and in marginal cell; stigma ferruginous, nervures rather light brown; b. n. meeting t. m.; first r. n. joining second s. m. a little beyond middle; third s. m. very broad below; legs bright ferruginous, with the apical half of anterior femora below, their tibiæ in front, spots on coxæ and trochanters, middle and hind femora at apex, yellow, hind femora and tibiæ strongly blackened behind; outer side of hind tibiæ tuberculate; abdomen not very broad, bright yellow with the hind margins of the segments reddish, and the extreme bases, as far as the fifth, black; the base of the second is black margined with red, and with a yellow streak on each side at extreme base; first segment conspicuously narrower than second, red at extreme base, then with a broad black band, edged posteriorly with red, then with an irregular but not broken yellow band, with a posterior subdorsal red emargination on each side, the broad hind margin of the segment dusky, very

¹ Vol. 20.

finely pubescent; apical plate strongly notched; venter yellow, with broad black bands at bases of second and fourth segments.

Habitat.—Arizona, from the Baker collection, with No. 1856.

Type.—Cat. No. 14024, U.S.N.M.

Distinguished among male *Xanthidium* by the red markings on the mesothorax. In the table of Rocky Mountain species it runs to *N. perivincta* Cockerell, the male of which is unknown, but from analogy with other species it is practically certain that it is not the male of *perivincta*. There is evident relationship with *N. elrodi* Cockerell, but that species differs by the broader face, black postscutellum, etc.

NOMADA OSBORNI, new species.

Male.—Length about 6 mm.; head and thorax black, quite densely clothed with entirely white hair; mesothorax with large strong punctures, the shining surface between them conspicuous on the disk; scutellum very flat; eyes pale olive-green; facial quadrangle longer than broad; face densely covered with white hair; mandibles simple, yellow with the apical part ferruginous; broad band beneath eyes, labrum, lower half of clypeus (with an upwardly directed angle in middle), and narrow lateral face-marks (ending in a very sharp point at about level of antennæ), all yellow; scape not much swollen, broadly yellow in front; flagellum bright ferruginous, nearly the basal half infuscated above; third antennal joint conspicuously shorter than fourth; tubercles and a small mark on lower part of pleura, almost hidden by hair, yellow, thorax otherwise black; tegulæ pale yellowish with a darker spot; wings a little smoky, darker at apex; stigma dark ferruginous, nervures fuscous; b. n. going just basad of t. m.; second s. m. receiving first r. n. in middle; third s. m. nearly as broad above as second; anterior legs light ferruginous, the tibiæ dark behind, and yellowish apically in front; middle and hind legs darker, strongly infuscated behind, the knees and apices of tibiæ yellow; hind tibiæ with much white hair behind; abdomen long and tapering, broadest at second segment, bright chestnut red, with very obscure small yellowish spots at sides of second and third segments; a broad yellow band on sixth segment, not reaching sides; first segment dark at base, and dusky on apical margin; broad apical margins of segments very thinly clothed with white hair; apical plate notched; venter red, the first segment with a cordiform black mark, at the end of which is a patch of white hair; apical ventral tuft of white hair small.

Habitat.—Tucson, Arizona (H. Osborn).

Type.—Cat. No. 14025, U.S.N.M.

A *Nomada* s. str., related to *N. vexator* Cockerell, but smaller, with differently colored tegulæ, the darker abdomen with much less yellow, etc. In the table of Rocky Mountain *Nomada* it runs to 66, and goes with *N. vexator* in a new division. The dorsum of thorax shining between the punctures, and the flattened scutellum, are highly distinctive.

