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Some Bees of the Genus *Nomada* From Washington State

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1910x

SOME BEES OF THE GENUS *NOMADA* FROM
WASHINGTON STATE.

By T. D. A. COCKERELL.

The University of Colorado.

Nomada mutans sp. nov.

♀. Length about 7 mm.; black with creamy-white markings, and hardly any hair; anterior coxæ without spines; head and thorax strongly punctured; head broad, with the following light markings: lateral marks, broad below, with a little notch on each side near to black part of clypeus, extending upward above level of antennæ, ending in a rather obtuse point, a little away from orbital margin; lower two thirds of clypeus, the margin of the light area broadly angled in the middle above; labrum, but the lower half suffused with reddish; basal half of mandibles (apical half reddish); and narrow posterior orbits; mandibles simple; second joint of labial palpi much less than half length of first; scape blackish behind, reddish in front, with an obscure yellowish mark; flagellum thick, dark reddish above, light ferruginous below, first joint paler; third antennal joint conspicuously longer than fourth; mesothorax shining between the strong punctures; light markings of thorax as follows: upper margin of prothorax, tubercles, tegulæ, scutellum, postscutellum, and a triangular spot on anterior part of pleura; scutellum little elevated; wings dusky, stigma ferruginous, nervures fuscous; t. m. a short distance basad of b. n.; first r. n. reaching second s. m. well beyond middle; legs black, with creamy-white spots on hind coxæ, apices of femora and apices and bases of tibiæ; anterior legs light ferruginous in front; middle legs nearly the same; hind femora with a reddish stripe; anterior tarsi entirely pale reddish; spurs white; abdomen very minutely punctured, with five entire broad creamy-white bands, the first with a pair of spots; band of silver-white hair on fifth segment rather narrow; venter with light bands.

Var. a. Postscutellum all black; band on first abdominal segment without enclosed spots, but with a ferruginous notch on each side behind.

Var. b. Smaller, length about $5\frac{1}{2}$ mm.; lateral marks not extending above antennæ; scutellum with two large light spots; postscutellum black; fourth and fifth abdominal bands broadly excavated in front on each side.

Hab.—Pullman, Washington State, 1908 (*W. M. Mann*). Two typical, Aug. 9; one var. a., Aug. 9; two var. b., Aug. 9 and 30. A

inda Cresson, but easily
 ie general appearance is
 is red legs. I wished to
 already a *Nomada manni*

nov.

n yellow; the anterior coxae
 h longer than fourth; b. n.
avis Cresson, and possibly
 owing distinctive characters:
 r above; no black between
 m. narrower, receiving the
 n pleura very large (fully
 om in front entirely yellow,
 band behind, middle tibiae
 lmost entirely black behind,
 al band; last joint of hind
domen strongly and sharply
 has been referred (Canad.
 ut it belongs with the new
 oth have in the male a pair
 x; Cresson's supposed male
 obably *N. formula* Viereck.

July 4, 1908 (*W. M.*

ibsp. nov.

rvallis, Oregon, form of *N.*
 holly light red; tegulae red-
 suffused with red, and re-
 st; yellow on scutellum re-
 oracic marks reddish, very
 y red; apical half of first
 cure yellowish spot on each
 s very broadly red in the
 ight ferruginous, and the
 istic broad form, with the
 e venation indicates its re-
 from the rather similar *N.*

N. civilis it is still more dis-
 of the abdominal segments

broadly black, all the femora and tibiae with large black patches be-
 hind, etc. In the table of Rocky Mountain species (Bull. 94, Colo.
 Exp. Sta.) it runs to 62, and runs out because it is a female with
 black thorax. The hair of the head and thorax above is strongly red-
 dish. The b. n. goes a considerable distance basad of t. m.

Hab.—Spokane, Washington State, May 30 (*W. M. Mann*).
 Among the European species, this insect has a strong superficial
 resemblance to *N. ruficornis* (specimen from Buda compared).

Nomada malonella sp. nov.

♂. Length about 7 mm.; head and thorax black, densely and very coarsely
 punctured, with white hair, which is dull and scanty above, clear white
 and more abundant below, abundant and shining on lower part of
 face; head transversely suboval, face very broad, eyes converging be-
 low; lower corners of face, extreme lower margin of clypeus and base
 of mandibles yellow; mandibles simple, apical half ferruginous with
 the apex black or almost; labrum black, pallid around the margins;
scape stout, wholly black; third antennal joint shorter than fourth,
 but more than half its length; flagellum long, rather thick, black above,
 broadly ferruginous beneath; area of metathorax rugose; *tegulae*
dark ferruginous, coarsely rugosopunctate; wings moderately dusky,
 the large stigma and nervures dark ferruginous; b. n. going far
 basad of t. m.; second s. m. broad above; legs red, the femora and
 tibiae largely black behind, the posterior ones almost wholly so; hind
 tarsi largely blackened; spurs white; abdomen narrow, light but
 dullish red, with fine whitish pubescence giving it a silky appearance;
 first segment with the basal half black, the other segments a little
 blackened at extreme base; extreme side of segments 2 to 5, with
 successively smaller cream-colored spots; segments 4 to 6 with also
 subdorsal spots; venter with imperfect cream-colored bands, out of
 which large pieces seem to have been cut at the sides. Allied to *N.*
elegantula Ckll. and somewhat to *N. melliventris* Cresson.

Hab.—Wawawai, Washington State, May 1, 1909 (*W. M.*
Mann).

A female (date and locality the same) seems to belong here, but
 may represent another species. It is only about 6½ mm. long,
 and differs from the male thus: Scape with a red spot at base;
 third antennal joint almost as long as fourth; thorax with red
 marks as follows: upper border of prothorax, tubercles, two fine
 lines on mesothorax, two spots on scutellum, axillar spots, a line on
 postscutellum, a spot beneath wings, and a transverse mark on

lower part of pleura; also other minor details. There is a small red spot above each eye. The upper side of the abdomen agrees with that of *N. angelarum* Ckll.

Nomada malonina sp. nov.

♂. Length about $5\frac{1}{4}$ mm.; looks at first sight like a small example of *N. malonella*, but differs as follows: Flagellum proportionately shorter; lower margin of clypeus broadly yellow at sides; light parts of legs paler and suffused with yellowish; hind legs black except the knees, and apices of the other joints; t. m. a little basad of b. n.; scutellum less prominent; ground-color of abdomen light yellowish-red; first segment with more than basal half black, the edge of the black rather concave in the middle (projecting to form an angle in *malonella*); fourth and following segments dark with a subapical yellow band; sides of segments 2 to 4 with a broad oblique light yellow band, on 2 and 3 with a dark patch in front; ground color of venter dark, and light bands much broader. In both species the apical plate is strongly notched.

Hab.—Wawawai, Washington State, May 15, 1909 (*W. M. Mann*).

The following table separates the four related species. The venation of *N. melliventris* was kindly noted for me by Mr. Viereck, from Cresson's type.

Basal nervure going far basad of transversomedial.....1.	
Basal nervure falling a little short of transversomedial.....2.	
1. Tegulae dark reddish; labrum black, except margins; scutellum prominent.....	<i>malonella</i> ♂
Tegulae yellowish; labrum yellow; scutellum not prominent, <i>melliventris</i> ♂	
2. Scape with a large red basal patch in front; ground color of abdomen bright coppery-red.....	<i>elegantula</i> ♀
Scape wholly black; ground color of abdomen pale yellowish-red	<i>malonina</i> ♂

Nomada (Gnathias) perplexans sp. nov.

♂. Length about 9 mm.; head and thorax black, with long coarse white hair, which is slightly stained with yellowish above; lower corners of face sending a linear process along orbits nearly to level of antennae, clypeus except sides above, labrum and basal half of mandibles, all light yellow; *scape entirely black*; flagellum red, the first five joints black above, the others with a blackish band; third antennal joint a little shorter than fourth; thorax densely and strongly punctured,

wholly black except the ruginous; wings strongly fusco-ferruginous; b. n. second s. m. well beyond at base behind, the other more black than red; abdomen and a pair of spots on apices of very large pale yellow; obscure yellowish spots; a suffused blackish band. Cresson, easily distinguish

Hab.—Pullman, Washing

Nomada

♀. Length $8\frac{1}{2}$ mm.; head and white (yellowish dorsally) red, face below antennae each antenna to clypeal blunt, but entire) entirely rowly, a large triangular mark on each side of mesopronotum, and a very large tubercles, and a very large shorter than fourth, scape with dusky; tegulae very wings very dark on apical dish; b. n. going a moderate, receiving first r. n. black, the edges of the black at base of first segment strongly blackened; apical tered glittering hairs; sides yellow spot; fourth segme

Hab.—Pullman, Washing
There is no sign of yellow male of this species is from

Nomada

♀. Length $8\frac{1}{2}$ mm.; bright ferruginous; eyes reddish-grey; a keel black, a large patch on front about ocelli; cheeks poster

ther minor details. There is a small
the upper side of the abdomen agrees
kill.

malonina sp. nov.

at first sight like a small example of *N.*
llows: Flagellum proportionately shorter;
oadly yellow at sides; light parts of legs
llowish; hind legs black except the knees,
ts; t. m. a little basad of b. n.; scutellum
or of abdomen light yellowish-red; first
al half black, the edge of the black rather
jecting to form an angle in *malonella*);
ents dark with a subapical yellow band;
h a broad oblique light yellow band, on 2
front; ground color of venter dark, and
In both species the apical plate is strongly

gton State, May 15, 1909 (*W. M.*

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id of transversomedial.....1.
short of transversomedial.....2.
black, except margins; scutellum promi-
.....*malonella* ♂
v; scutellum not prominent, *melliventr* ♂
atch in front; ground color of abdomen
.....*elegantula* ♀
lor of abdomen pale yellowish-red

malonina ♂

ias) *perplexans* sp. nov.

nd thorax black, with long coarse white
d with yellowish above; lower corners of
; along orbits nearly to level of antennæ,
labrum and basal half of mandibles, all
black; flagellum red, the first five joints
a blackish band; third antennal joint a
thorax densely and strongly punctured,

wholly black except the reddish tubercles; tegulæ very bright fer-
ruginous; wings strongly dusky at apex; stigma ferruginous, nervures
fusco-ferruginous; b. n. going far basad of t. m.; first r. n. joining
second s. m. well beyond middle; legs red, the anterior femora black
at base behind, the other femora with more black, the hind ones with
more black than red; abdomen clear red, first segment with basal half
and a pair of spots on apical half black; second segment with a pair
of very large pale yellow patches, pointed mesad; sixth with a pair of
obscure yellowish spots; apical plate notched; venter red with broad
suffused blackish bands. A western representative of *N. perplexa*
Cresson, easily distinguished by the much lighter red abdomen.

Hab.—Pullman, Washington State, June 7, 1908 (*W. M. Mann*).

Nomada itamera sp. nov.

♀. Length $8\frac{1}{2}$ mm.; head and thorax coarsely rugosopunctate, with scanty
white (yellowish dorsally) hair; black, with the following parts dark
red, face below antennæ except a broad black band extending from
each antenna to clypeal margin, mandibles (which are stout and
blunt, but entire) entirely, labrum, posterior orbits extremely nar-
rowly, a large triangular mark above each eye, a large V-shaped
mark on each side of mesothorax, the greater part of the extremely
prominent and strongly bilobed scutellum, upper border of prothorax,
tubercles, and a very large patch on pleura; antennæ thick, third joint
shorter than fourth, scape red in front, flagellum dark red suffused
with dusky; tegulæ very bright ferruginous, strongly punctured;
wings very dark on apical margin, stigma and nervures dark red-
dish; b. n. going a moderate distance basad of t. m.; second s. m.
large, receiving first r. n. at middle; legs red, the femora with much
black, the edges of the black suffused; abdomen broad, dark red, black
at base of first segment trilobed, apical margin of first two segments
strongly blackened; apical half of abdomen darker, with minute scat-
tered glittering hairs; sides of second segment with a round suffused
yellow spot; fourth segment with a pair of subdorsal yellow spots.

Hab.—Pullman, Washington State, May 30 (*W. M. Mann*).
There is no sign of yellow at lower corners of face. A probable
male of this species is from Wawawai, May 15.

Nomada orcusella sp. nov.

♀. Length $8\frac{1}{3}$ mm.; bright ferruginous; head and thorax rugosopunctate;
eyes reddish-grey; a keel between antennæ; the following parts are
black, a large patch on front, including antennal sockets, a small area
about ocelli; cheeks posteriorly, a median stripe on mesothorax, a

stripe on metathorax, area between wings and middle and hind legs, and region round tubercles; third antennal joint shorter than fourth; scape red; flagellum entirely red; scutellum bigibbous; tegulae bright ferruginous, punctured; wings strongly dusky, with a hyaline area beyond submarginal cells; stigma dark ferruginous, nervures dark fuscous; b. n. going far basad of t. m.; first r. n. entering second s. m. much beyond middle; legs red, hind femora with much black, the others with some at base; hind basitarsus suffused with blackish; abdomen shining bright ferruginous, the segments not at all dark-margined, first segment black at extreme base and half-way along sides in second segment, with a large yellow spot on each side, third with very small spots; apical segments without yellow; venter without yellow. The mandibles are simple, and there is no yellow at lower corners of face.

Hab.—Orcus Island, Washington State, latter half of July, 1909 (*W. M. Mann*). The following table separates several females of *Nomada* s. str. described from Washington State:

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Abdomen without yellow spots..... | kincaidiana Ckll. |
| Abdomen with yellow spots, at least on second segment..... | 1. |
| 1. Metathorax black, except for a couple of hardly visible red spots on enclosure; abdomen with scanty short silvery hairs, shining in certain lights..... | itamera Ckll. |
| Metathorax red with a central black band; abdomen without shining silvery hairs..... | 2. |
| 2. Abdomen deep chestnut red; wings darker..... | orcusella Ckll. |
| Abdomen light red..... | flammigera Ckll. |

The *Nomadæ* of Washington State were listed and tabulated by Viereck in Canadian Entomologist, Aug. 1905. A collection received from Mr. W. M. Mann contains not only the new forms described above, but also several others new to the state, so it will be worth while to give a new list, complete to date. I have omitted from it some males of *Nomada* s. str., which probably belong with females already described, but cannot be certainly associated with them at present.

Gnathias.

This group differs from all the others in having bidentate mandibles.

- (1.) *N. perbella* Viereck. Hoquiam (*Burke*, fide Viereck); Olympia and Seattle (*Kincaid*, fide Viereck); Wawawai, May 1, both sexes (*Mann*); Pullman, May (*Mann*).

Mr. Mann's specimens have Viereck's description in bold; but the Kincaidian is valid; but the Kincaidian is Nat. Sci. Phila., 1903, p. 60. female paler than in typical. More collecting is needed for species.

- (2.) *N. perplexans*, n. sp. Pu.
 (3.) *N. cuneata* Robertson. I typical; from a single s is a distinct northwest
 (4.) *N. grayi eastonensis* Ckll.
 (5.) *N. washingtoni* Ckll.

Nomada

- Like *Gnathias* but with simple
 (6.) *N. flammigera* Ckll. N. Hist., July, 1906, p. 71.
 (7.) *N. cressoni trevoriana* Ckll.
 (8.) *N. kincaidiana* Ckll.
 (9.) *N. itamera* n. sp. Pullman
 (10.) *N. orcusella* n. sp. Orcus
 (11.) *N. malonella* n. sp. Wawawai
 (12.) *N. malonina* n. sp. Wawawai
 (13.) *N. packardiella* Ckll., var. large yellow patch on fifth 1909 (*Mann*).
 (14.) *N. pulsatillæ* Ckll., var. a. Pullman, May 2, Spokane
 (15.) *N. vicinalis aldrichi* Ckll.

X.

- (16.) *N. citrina* Cresson.
 (17.) *N. rivalis* Cresson.
 (18.) *N. civilis* Cresson. Males v 24 to May 15, and Pullman
 (19.) *N. civilis spokaneensis* n. sp.
 (20.) *N. modocorum* Ckll. Spokane
 (21.) *N. coquillettei* Ckll. Wawawai

The characters originally given for *modocorum* are not constant; as follows:

s and middle and hind legs, al joint shorter than fourth; um bigibbous; tegulae bright dusky, with a hyaline area ferruginous, nervures dark; first r. n. entering second and femora with much black, arsus suffused with blackish; e segments not at all dark-ne base and half-way along yellow spot on each side, third without yellow; venter without there is no yellow at lower

ate, latter half of July, e separates several females agton State:

.....kincaidiana Ckll.
second segment.....1.
f hardly visible red spots on
lvery hairs, shining in certain
.....itamera Ckll.
nd; abdomen without shining
.....2.
er.....orcusella Ckll.
.....flammigera Ckll.

ere listed and tabulated by
g. 1905. A collection re-
is not only the new forms
new to the state, so it will
lete to date. I have omitted
which probably belong with
be certainly associated with

having bidentate mandibles.
ke, fide Viereck); Olympia and
Wawawai, May 1, both sexes

Mr. Mann's specimens have the abdomen dark red, and agree with Viereck's description in both sexes. On this basis, the species seems valid; but the Kincaidian specimens, which I formerly (Proc. Acad. Nat. Sci. Phila., 1903, p. 601) referred to *N. bella* Cresson, have the female paler than in typical *bella*, and do not seem to be *perbella*. More collecting is needed to determine whether there are really two species.

- (2.) *N. perplexans*, n. sp. Pullman (Mann).
- (3.) *N. cuneata* Robertson. Pullman, May (Mann). This is not quite typical; from a single specimen I cannot determine whether there is a distinct northwestern race.
- (4.) *N. grayi eastonensis* Ckll. Easton.
- (5.) *N. washingtoni* Ckll.

Nomada s. str. (Robertson.)

Like *Gnathias* but with simple mandibles.

- (6.) *N. flammigera* Ckll. N. Yakima (Jenne); see Ann. and Mag. Nat. Hist., July, 1906, p. 71.
- (7.) *N. cressoni trevoriana* Ckll. Olympia (Kincaid).
- (8.) *N. kincaidiana* Ckll.
- (9.) *N. itamera* n. sp. Pullman (Mann).
- (10.) *N. orcusella* n. sp. Orcus I. (Mann).
- (11.) *N. malonella* n. sp. Wawawai (Mann).
- (12.) *N. malonina* n. sp. Wawawai (Mann).
- (13.) *N. packardella* Ckll., var. a. Mesothorax with three black stripes; a large yellow patch on fifth abdominal segment. Pullman, May 14, 1909 (Mann).
- (14.) *N. pulsatilloe* Ckll., var. a. Silvery apical lunule on abdomen larger. Pullman, May 2, Spokane, May 30, and Wawawai, May 1 (Mann).
- (15.) *N. vicinalis aldrichi* Ckll. Spokane, May 30 (Mann).

Xanthidium.

- (16.) *N. citrina* Cresson.
- (17.) *N. rivalis* Cresson.
- (18.) *N. civilis* Cresson. Males with scutellum all dark. Wawawai, April 24 to May 15, and Pullman, May 20 (Mann).
- (19.) *N. civilis spokaneensis* n. subsp. Spokane (Mann).
- (20.) *N. modocorum* Ckll. Spokane, May 30 (Mann).
- (21.) *N. coquilletti* Ckll. Wawawai, March and April (Mann).

The characters originally given to separate *N. coquilletti* from *N. modocorum* are not constant; the Washington State specimens separate as follows:

- (a.) Abdomen red, yellow and black; tegulae red; scutellum with two red spots; metathorax without spots; legs red and black.
 (a.) Larger (and with other differences) *N. vicinalis aldrichi*
 (b.) Smaller.....*N. modocorum*
 (b.) Abdomen black and yellow, with a little reddish; legs yellow, red and black; tegulae yellow, at least in part; scutellum, post-scutellum and metathorax black.....*N. coquilletti* ♂
 (22.) *N. pascoensis* Ckll. Pasco (*Kincaid*); Wawawai, May 15 (*Mann*).
 (23.) *N. jennei* Ckll. N. Yakima (*Jenne*). Not a true *Xanthidium*; there is apparent affinity with *Micronomada*; see *Canad. Entom.*, 1906, p. 282.

Holonomada.

- (24.) *N. hesperia* Ckll. Pullman, May 15 and 23, 1909 (*Mann*). One is much smaller than the other.
 (25.) *N. edwardsii* Cresson. Pullman, June 1 (*Mann*).
 (26.) *N. vinnula* Cresson. Spokane, May 20, Wawawai, May 15, and Pullman, May 23 (*Mann*).
 (27.) *N. mutans* n. sp. Pullman (*Mann*).

Micronomada.

- (28.) *N. semisuavis* n. sp. Wawawai (*Mann*).

Nomadula.

- (29.) *N. articulata* Smith. Pullman, May 28 (*Mann*).
 (30.) *N. erythrochroa* Ckll. Pasco (*Kincaid*); N. Yakima, June (*Jenne*).

SOME NEUROPTI

By N.

East Fa

From Professor Perkins of Queensland, I have received The Chrysopidae and a few oth There are four genera of (*Nothochrysa*, *Ankylopteryx*, e in the United States, but *Noth* us *Chrysopa* is the largest ger similar to some of our forms.

C

The Australian forms know following table:

1. Dark marks on the vertex....
No marks on the vertex....
2. Veins all green.....
Veins partly black.....
3. A black spot on the radial sec
No such spot.....
4. Many veins more or less margi
Veins not margined.....
5. A band across the face.....
No band across face.....
6. Basal part of antennae black
Antennae all pale.....
7. Vertex mostly red, face reddis
Vertex yellowish, a transverse
eye to eye.....
8. Divisory veinlet commonly endi
slender, acute.....
Divisory veinlet ending beyond
9. Larger species; stigma indistinct
Medium species, stigma not ve
broad.....
Smaller species, a reddish spot
prominent.....