

A REVISION OF THE NORTH AMERICAN SPECIES OF  
THE DIPTEROUS GENUS NEURIGONA.  
(DOLICHOPODIDÆ.)

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The Dipterous genus *Neurigona* was established by Rondani in Dipt. Ital. prodromus in 1856, with one species, *quadrifasciata* Fabr., which is therefore the type of the genus. In 1829 Thomas Say described an American species as *Medeterus lateralis*. Dr. Loew in 1864 published three others, *dimidiata*, *rubella*, and *tenuis*, and in 1869 a fourth, *carbonifer*. In 1899 W. M. Wheeler added two more, *floridula* and *lienosa*, thus giving us seven described species from America north of Mexico. From farther south Prof. Aldrich has described *decora* and *signifer* from Grenada and St. Vincent, and J. R. Schiner has given us *brasiliensis* from Brazil. These are all the species previously described from America so far as I can learn.

The genus *Neurigona* as characterized by Dr. Loew under the name *Saucropus* in his Monograph of the Dolichopodidæ of North America are:

"First joint of the antennæ without hair on the upper side; arista dorsal; thorax with a sloping area upon the middle of its posterior end; feet very long and slender; hind tibiæ elongated, the first joint of hind tarsi without bristles, shorter than the second; abdomen elongated and narrow, especially in the male; hypopygium disengaged, short and stout, inflected, with short very little developed appendages; color of the body principally or at least partially yellow; hairs and bristles mostly black."

The above characters serve to define the genus as I use it in the present paper but there are some exceptions that should be noted. The bristles of the dorsum of the thorax are always black, thus separating the species of this genus from those of the genus *Chrysotimus* where they are yellow, but those of the abdomen are often pale as are also the hairs especially in the male. There is a group of western species which are entirely or almost entirely blackish; the first joint of the hind tarsi is sometimes longer than the second, as is the case in *superbiens* Loew, which is synonymous with *lateralis* Say, and fully as long in the male of *tenuis* Loew, also longer in *australis* n. sp.

In the table of genera of the Dolichopodidæ in Williston's Manual of the North American Diptera under No. 28 we have to take fourth vein converging towards the third in order to

run a specimen through to the genus *Neurigona*. In most of our species this is true but there are several exceptions. Dr. Loew in his Monograph of the Dolichopodidæ says that in the South African species the third and fourth veins are parallel, which is also the case with *N. signifer* Aldrich, and in one or two of the species described in this paper. I might add that the abdomen of the female is prolonged into more or less of an ovipositor, as this character is of importance in separating this genus from *Xanthochlorus* where the female abdomen is blunt or rounded at the tip.

Fred Kowarz in Wiener Entomologische Zeitung, II, p. 51, uses the following characters in taking a specimen through to the genus *Neurigona*: "Acrostichal bristles present, in two rows; Arista dorsal; Fourth longitudinal vein not forked; hind coxæ with a single erect bristle on the outside; body color not metallic." These characters hold good in all of the species included in this paper that I have seen except that in *N. albospinosa* n. sp. there are several weak and one stronger bristle on the outside of the hind coxæ; and the last character given would have to be used in a qualified sense.

There are a few characters which are common to most if not all of our species: The lateral and lower orbital cilia are always pale, as are also the cilia of the tegulæ. The hind coxæ have a single large black bristle on the outside, except in *albospinosa* n. sp. which has one large and several weaker whitish bristles on the outside of the hind coxæ. There are two large black bristles on the margin of the scutellum, and in most of our species there is a pair of weak bristles or hairs outside of these. In all of our species that I have examined, and in the two European species that I have seen, (*4-fasciata* Fab. and *suturalis* Fall.), there are one or more pale yellowish bristles above the front coxæ; and often a black bristle on the middle and hind trochanters. The hairs on the legs are arranged in longitudinal rows, and the lower surface of the femora are usually bare. The males of many of our species have a ventral extension of the fifth segment of the abdomen into which the hypopygium partly fits when bent under the abdomen as it is ordinarily carried, I have called these extensions sheaths, they are bilobed, and form characters that can sometimes be used in separating the species.

Most of our species of *Neurigona* are found on the trunks of trees but I sometimes take specimens, mostly of the *rubella* group, while sweeping. In most cases these insects will fly to a tree and alight instantly and rest in one position until they are disturbed or wish to change their location when they make a quick short flight alighting generally a little distance higher up or sometimes to one side, seldom or never lower down. I have often seen them start near the ground and work upwards in short flights until they disappeared from view at a height of perhaps eighteen feet. The male often comes to a tree and flies upward in a perfectly vertical line about two inches from the trunk until it disappears from sight or alights about twelve feet or more above the ground; it may be looking for the female or possibly seeking its prey. In several instances I have seen individuals feeding on Psocid larva.

I have watched the courtship of the males a number of times, they hover over the female for a few seconds and then try and alight upon her, but only once did I see the union consummated, in all other cases the female darted away.

As far as I can learn the only species in our fauna that has been bred is *N. viridis* n. sp. Mr. James Angus, of West Farms, N. Y., makes the following note on this species: "Larva feeding in rotten wood of hickory." We have no description of this larva or pupa, but a pupa case is mounted with Mr. Angus' specimen in the National Museum collection.

The sexes of this genus seem to be unevenly distributed. At one time I will take nearly all males, at another mostly females. One afternoon I took seven males and thirty-five females of *tenuis*, while the next morning in woods a mile and a half distant I took twenty-two males and but nine females of the same species. At another time I took fourteen males of *floridula* var. *infuscata* and no female, but with them were several males and females of *deformis* n. sp. At another time I took many males of *tarsalis* in one spot with females of two other species, and a half mile farther on found both males and females.

The drawings for this paper were made with a camera lucida by Mr. William Wild, of East Aurora, N. Y. The drawings of the hypopygiums give a good idea of the general appearance but no attempt was made to go into anatomical details.

I wish to acknowledge my indebtedness to those who have sent me material for study, and thereby made the revision of this genus possible. To Prof. J. M. Aldrich for the loan of his material, and his help during the preparation of this paper; to the authorities of the National Museum for the loan of specimens, and to Mr. Knab for his help in looking up references in the National Museum library; to Mr. Nathan Banks, Prof. C. W. Johnson, Prof. A. L. Melander, and Mr. V. A. E. Daecke, for the loan of their material; and to Mr. E. T. Cresson for the loan of the material of the American Entomological Society.

## TABLE OF SPECIES.

## MALES.

1.	Dorsum of the thorax mostly black, green or blue .....	2
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2.	Hypopygium yellow.....	3
	Hypopygium black or testaceous.....	7
3.	Dorsum of the thorax bright blue. (West Indies).....	16 <i>decora</i>
	Dorsum black or greenish.....	4
4.	Abdomen with black bands.....	5
	Abdomen marked with green.....	6
5.	Front tibiæ with a row of bristles above, front tarsi plain.....	27 <i>tibialis</i>
	Front tibiæ plain, third joint of front tarsi white, fourth and fifth joints black .....	23 <i>tarsalis</i>
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7.	Abdomen yellow with black bands.....	8
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	Costa normal.....	10
9.	Front tarsi with the second, third and fourth joints flattened and fringed with hairs.....	18 <i>deformis</i>
	Front tarsal joints not flattened, fifth black and bent at a right angle.....	17 <i>arcuata</i>
10.	Thorax bright shining green.....	15 <i>viridis</i>
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11.	Front tarsi plain.....	14
	Front tarsi ornamented.....	12
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13.	Front tarsi two-thirds as long as their tibiæ.....	20 <i>pectoralis</i>
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14.	Pluræ and dorsum blackish.....	21 <i>aestiva</i>
	Pluræ and sides of dorsum yellow, most of dorsum black and polished.....	5 <i>nitida</i>
15.	Front tarsi plain.....	31 <i>albospinosa</i>
	Front tarsi with an oval tip.....	16
16.	Front tibiæ longer than their tarsi.....	29 <i>perbrevis</i>
	Front tibiæ shorter than their tarsi.....	30 <i>australis</i>
17.	Front tarsi ornamented.....	18
	Front tarsi plain.....	19
18.	Front tarsi with an oval tip.....	4 <i>carbonifer</i>
	Front tarsi with the second joint flattened and widened at the tip, other joints cylindrical.....	12 <i>aldrichii</i>

19. Abdomen yellow with black bands.....22  
 Abdomen yellow without black bands.....20
20. Fourth joint of front tarsi nearly two-thirds as long as third, last four joints  
 infuscated.....14 *disjuncta*.  
 Fourth joint only about one-third as long as third, fifth joint black.....21
21. Wings hyaline, tinged with yellow, veins yellow.....9 *floridula*  
 Wings with a cloud at tip, tinted with brownish, veins brownish.....  
 10 *floridula* var. *infuscata*
22. Dorsum of the thorax with the flattened space before the scutellum yellow..23  
 Dorsum with the flattened space blue or black.....24
23. Dorsum of the thorax yellow, immaculate.....14 *disjuncta*  
 Dorsum with two or three black spots.....8 *maculata*
24. Flattened space before the scutellum a beautiful greenish blue (West  
 Indies).....7 *signifer*  
 Flattened space black.....25
25. All the hairs and bristles of the front and middle coxæ yellow...3 *dimidiata*  
 Hairs and bristles of the middle coxæ mostly black.....26
26. Front tibiæ with a row of bristles.....27 *tibialis*  
 Front tibiæ plain.....27
27. Front metatarsi about one and one-fourth times as long as their tibiæ.  
 1 *rubella*  
 Front metatarsi about equal to their tibiæ.....2 *perplexa*

## FEMALES.

1. Dorsum of the thorax largely yellow.....16  
 Dorsum mostly blue, green, or blackish.....2
2. Dorsum of the thorax bright shining blue. (West Indies).....3 *decora*  
 Dorsum green or blackish.....3
3. Dorsum bright shining green.....15 *viridis*  
 Dorsum dull greenish or blackish.....4
4. Dorsum dull greenish.....5  
 Dorsum black or gray.....14
5. Tip of the fourth vein ending distinctly before the apex of the wing.....6  
 Tip of the fourth vein ending in the tip of the wing, or nearly so.....7
6. Tergum of the last two segments of the abdomen dull green, middle and  
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 Tergum with more or less brilliant green, femora without a bristle near  
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7. Abdomen fasciate.....9  
 Abdomen of nearly uniform color.....8
8. Large species, 4.5 mm. (New Mexico).....30 *australis*  
 Smaller species, 2 mm. (Eastern species).....32 *minuta*
9. Wings strongly tinged with yellow on the costal edge.....10  
 Wings nearly uniform grayish hyaline.....11
10. Wings with distinct clouds at the tips of third and fourth veins..18 *deformis*  
 Wings evenly tinged along the front, not darker at tip.....17 *arcuata*
11. Dorsum of the thorax covered with brown pollen which nearly hides the  
 ground-color. (Calf.).....24 *lienosa*  
 Dorsum with grayish, or white pollen.....12
12. Pleuræ and dorsum without yellow, except the humeri and sometimes the  
 lateral edges and posterior angles.....13  
 Pleuræ and dorsum with considerable yellow.....19 *tenuis*
13. Pleura and dorsum without yellow except the humeri.....20 *pectoralis*  
 Dorsum with the humeri, lateral edges to the base of the wings, and the  
 posterior angles yellow.....23 *tarsalis*
14. Dorsum black with the humeri, lateral edges, and two stripes extending  
 forward on each side of the flattened space yellow.....6 *tridens*  
 Dorsum of the thorax gray.....15
15. Dorsum of the thorax with three metallic brown vittæ.....31 *albospinosa*  
 Dorsum with two nonmetallic brown vittæ.....22 *bivittata*

- 16. Dorsum of the thorax with the flattened space before the scutellum black,  
     gray, green, or blue..... 17  
     Dorsum with the flattened space yellow..... 25
- 17. Flattened space on the dorsum a beautiful greenish blue..... 7 *signifer*  
     Flattened space black, gray, or dull green..... 18
- 18. Flattened space on the dorsum and more or less of the dorsum dull green.  
     19 *tenuis*  
     Flattened space black or gray..... 19
- 19. Flattened space and most of the dorsum gray..... 22 *bivittata*  
     Flattened space black..... 20
- 20. Dorsum of the thorax and the black central line shining..... 5 *nitida*  
     Dorsum less shining, and without distinct central line..... 21
- 21. Dorsum with the anterior half and three stripes extending backward  
     black..... 6 *tridens*  
     Dorsum with only the flattened space black..... 22
- 22. Front metatarsi only three-fourths as long as their tibiæ..... 4 *carbonifer*  
     Front metatarsi about equal to their tibiæ..... 23
- 23. First and second joints of hind tarsi equal..... 3 *dimidiata*  
     Second joint of hind tarsi longer than the first..... 24
- 24. Posterior cross-vein rectangular..... 1 *rubella*  
     Posterior cross-vein a little oblique..... 2 *perplexa*
- 25. Abdomen fasciate with black..... 26  
     Abdomen not distinctly fasciate..... 27
- 26. Dorsum of the thorax without black spots. Length 3 mm..... 12 *aldrichii*  
     Dorsum with three black spots. Length 4.5-5 mm..... 8 *maculata*
- 27. Dorsum of the thorax dull with thick yellow pollen..... 28  
     Dorsum shining, only thinly pollenose, pollen whitish..... 29
- 28. Dorsum evenly and thickly pollenose..... 11 *flava*  
     Dorsum with pollenose vittæ..... 18 *transversa*
- 29. Tips of third and fourth veins widely separated..... 14 *disjuncta*  
     Tips of third and fourth veins approximated..... 30
- 30. Veins yellow..... 9 *floridula*  
     Veins brownish..... 10 *floridula* var. *infuscata*

1 *Neurigona rubella* Loew.

Figure 1.

*Saucropus rubella* Loew, Neue Beitr., viii, p. 76, 1861; Mon. N. Am. Diptera, ii, p. 226, 1864.

Thorax and abdomen yellow, the former with the flattened space before the scutellum black, the latter with black bands; hypopygium black; front metatarsi about one and one fourth times as long as their tibiæ, with bristles below. Length 5 mm.

Malc: Face very narrow, almost linear, and with the palpi silvery white; proboscis yellow; antennæ deep yellow, the first joint paler, arista yellowish brown; front and occiput black, the ground color concealed by thick white pollen. Dorsum of the thorax reddish yellow with the flattened space before the scutellum black and covered with whitish pollen; humeri and pleuræ pale yellow, the latter with white pollen, and with a black spot in front of the halteres; metanotum black, with the sides yellowish. Abdomen yellow, dorsum of the second, third, and fourth segments with black bands, that on the second near the base and narrowing at the extreme lateral edges, that on the third at the base and of equal width throughout, the one on the fourth at base and narrowed at the sides not reaching the lateral edges, but forming a subtriangular spot; fifth segment straight above with the front and hind angles square, the upper edge infuscated, and with the

ventral sheath black; the hairs on the dorsum of the abdomen appear reddish or yellowish when viewed from above, but more blackish when seen from the side; hypopygium small, testaceous, rounded above, with yellow hairs on the upper part, appendages partly yellowish. Legs yellowish; front coxæ with delicate yellow hairs on the front surface and yellow bristles near the tip, these bristles brownish in certain lights; middle coxæ with black hairs and bristles on the front side near the tip, and some very minute yellow hairs above; hind coxæ with the usual black bristles on the outside, there is also a small bristle on each middle and hind trochanter; front metatarsi one and one-fourth times as long as their tibiæ, the remaining four tarsal joints taken together somewhat shorter than their tibiæ, second and third joints brownish; front tibiæ and tarsi with the hairs long, and with a row of longer hair-like bristles on the lower surface of the tibiæ and the first three joints of the tarsi, these hairs nearly as long as the diameter of the tarsal joints, there is also a row of shorter and stouter hairs on the upper surface of these joints; middle metatarsi about as long as their tibiæ, the remaining four joints together about one-fifth shorter than their tibiæ; hind tarsi about as long as their tibiæ, second joint a little longer than the first; middle and hind tarsi brown from the tip of the first joint. Wings hyaline, tinged with yellowish in front of the third vein; posterior cross-vein perpendicular to the fifth vein; third vein bent backward at tip, fourth vein quite sharply arched forward from a little beyond the middle of its last section and ending rather close to the tip of the third vein; tip of the fourth vein distinctly before the apex of the wing; posterior cross-vein about twice its length from the wing margin measured on the fifth vein; veins brownish.

Female: Differs from the male in having the bristles of the front coxæ black, these bristles are large and conspicuous; the front tarsi are brownish and hardly twice as long as their tibiæ, the first joint hardly as long as their tibiæ; middle metatarsi a little shorter than their tibiæ; second joint of hind tarsi only slightly longer than the first.

Dr. Loew says in his description of this species that the metanotum is black only on its base and along the center. I have specimens before me which exactly agree with this, but others have the metanotum almost entirely black, only a very little yellowish at the sides.

I have described the male of this species from two specimens: one in the National Museum collection, taken by Mr. Burgess at Beverly, Mass., September 6, 1874, and the other (a broken specimen) taken at Sea Cliff, N. Y., by Mr. Nathan Banks. The males seem to be rare, although the females are taken all through the eastern states quite commonly; I have taken them around Buffalo, N. Y., and have seen specimens from Connecticut, Massachusetts, New Jersey, Pennsylvania, Virginia; and Kansas. Mrs. Slosson reports it from New Hampshire.

Note.—The females of the five following species which have the dorsum of the thorax yellow, and the flattened space before the scutellum black can be separated as follows: *nitida* differs from the other four by having a central shining black line on the dorsum; *carbonifer* has the front metatarsi only three-fourths as long as their tibiæ, while in *dimidiata*, *rubella*, and *perplexa*, the front metatarsi are nearly equal to their tibiæ; in *dimidiata* it is fully as long, and in the others hardly as long as their tibiæ, *dimidiata* has the first and second joints of the hind tarsi equal, while in the other two the second joint is distinctly the longest, in the last two the bend in the last section of the fourth vein is sharper, and the tarsi are darker than in *dimidiata*; the only difference between the females of *rubella* and *perplexa* that I can see is that in *rubella* the posterior cross-vein is rectangular while in *perplexa* it is a little oblique, but it is difficult to separate them.

I have compared the female of the European species *N. quadrifasciata* Fab. which is the type species of the genus, and closely related to this group, and find that it differs from all of our five species mentioned above, by having the third and fourth veins more widely separated at the tips, the fourth vein ending in the apex of the wing, while in our species the fourth vein ends distinctly before the apex of the wing. Fig. 28 is the apical part of the wing of *quadrifasciata* Fab.

I have also examined *N. suturalis* Fall. of Europe, and find it quite distinct from any of our species.

## 2 *Neurigona perplexa* n. sp.

Figure 2.

Thorax and abdomen yellow, the former with the flattened space before the scutellum black, and the latter with black bands; hypopygium black, small. Hairs and bristles of the front coxæ whitish; front metatarsi about the length of their tibiæ. Length  $4\frac{1}{2}$  mm.

Male: Face very narrow, eyes almost touching on the center of the face, leaving only a small triangle above and below, face and palpi silvery white; proboscis and antennæ yellow, arista brownish; front and occiput black, covered with white pollen; frontal and post-vertical bristles black; orbital cilia whitish. Thorax yellow; the humeri and lateral edges of the dorsum whitish yellow; flattened space before the scutellum black, with white pollen; a dark central line on the dorsum between the acrostichal bristles, reaching from the black flattened space to the front of the dorsum (this may not be found in all specimens); pleuræ pale yellow, with white pollen, and the usual black spot in front of the halteres; scutellum yellow with a black spot at base; bristles of

the thorax black, those on the posterior part large, a space on each side above the humeri and reaching about half way to the root of the wings covered with short black bristles; metanotum black with yellow on the sides. Abdomen yellow with black bands at the base of the second, third, and fourth segments, these bands narrowed laterally, hardly reaching the sides below, and emarginate on the center of the dorsum; fifth segment small, with the ventral sheath black; hairs of the abdomen black, those on the fifth segment, and a few along the sides yellow; hypopygium black or testaceous, small, subquadrate, and rounded behind. Legs pale yellow; front coxæ with yellow hairs and bristles; middle coxæ with black hairs and bristles; front metatarsi about the length of their tibiæ, the four remaining joints together about the length of the first, the fourth joint very slightly flattened, third joint nearly twice the length of the fourth; hairs on the front tarsi quite long; middle metatarsi about as long as their tibiæ; hind tarsi with the second joint longer than the first. Wings hyaline, hardly tinged with grayish; veins yellowish brown; posterior cross-vein somewhat oblique.

Female; I place with the male described above a single female closely related to *rubella*, but somewhat smaller and with the posterior cross-vein a little oblique; it agrees with the male in all but sexual characters.

Described from one male in the National Museum collection, taken at Lehigh Gap, Pa., July 23, 1907, by C. T. Greene; and one female sent me by Prof. C. W. Johnson and labeled *Capens*, Me., July 21, 1901.

Note.—This is closely related to *rubella* and *nitida*, but the male differs from the later by having only a black central line on the dorsum of the thorax, the abdominal bands are emarginate, the front tarsi have shorter hairs below, the fourth joint is very slightly flattened, and the posterior cross-vein is twice its length from the wing margin measured on the fifth vein, in *nitida* it is less than twice its length from the margin and the fourth joint of front tarsi is cylindrical. From *rubella* it differs in having the front of the wing less arched; all the tarsi are darkened from the base a little, but the dark part not as distinctly marked as in *rubella*, the front metatarsi are about the same length as their tibiæ while in *rubella* they are very distinctly longer. In *rubella* the third and fourth joints of the front tarsi are about equal while in this species the third is nearly twice as long as the fourth. This species is a little smaller than *rubella* and the posterior cross-vein is a little oblique while in *rubella* it is perpendicular to the fifth vein. It differs from *dimidiata* by having black hairs and bristles on the middle coxæ, while *dimidiata* has only yellowish hairs and

bristles on the middle coxæ; *dimidiata* also has pale hairs on most of the first four segments of the abdomen while in this species they are mostly black, the front of the wing in this species is also more arched.

### 3 *Neurigona dimidiata* Loew.

Figure 3.

*Saucropus dimidiata* Loew, Neue Beitr., viii, p. 75, 1861; Mon. N. A. Diptera, ii, p. 225, 1864.

Thorax and abdomen yellow, the former with the flattened space and sometimes a central line black, the latter with black bands; bristles and hairs of the front and middle coxæ all yellowish; front metatarsi about the same length as their tibiæ. Length 4 mm.

Male: Eyes almost touching on the middle of the face; face and palpi silvery white; proboscis and antennæ yellow, arista brownish; front and occiput black, thickly white pollenose, the pollen on the occiput, the flattened space before the scutellum, and the metanotum appears to be tinged with blue; orbital cilia whitish. Thorax yellow, reddish yellow and shining on the dorsum, white pollenose on the pleuræ, there is the usual small black spot on the pleuræ in front of the halteres; the flattened space on the dorsum black, and a black central line extends from this to the front of the thorax between the acrostichal bristles, this line seems to be a variable character, in one of the specimens before me it is almost wanting; humeri yellowish white; metanotum black; scutellum yellow, lighter colored on the disk and somewhat shining. Abdomen yellow with rather narrow black bands on the second, third, and fourth segments, those on the third and fourth sometimes not very sharply defined; the hairs of the abdomen mostly yellowish, the marginal row of bristles on the first segment black and rather short; fourth segment produced on the venter on the posterior end; fifth segment higher than long, somewhat pointed in front on the dorsum, entirely yellow except the brown ventral sheath, and with rather long yellow hair. Hypopygium black or testaceous, polished, and rather small with yellowish appendages. Legs pale yellow; front and middle coxæ with all the hairs and bristles yellowish white; hind trochanters with a small black bristle; front tarsi more than twice the length of their tibiæ, and with a row of long hairs below; front metatarsi a little longer than their tibiæ; middle metatarsi about the same length as their tibiæ; hind tarsi a little shorter than their tibiæ, first joint a very little shorter than the second; all the tarsi infuscated from the tip of the first joint. Wings hyaline, very slightly tinged with grayish; the bend in the fourth vein rather sharp and at the middle of the last section; tip of the fourth vein before the apex of the wing; posterior cross-vein a little less than twice its length from the wing margin, measured on the fifth vein.

Female: A single female that I take to be the female of this species has black hairs and bristles on the middle coxæ, and black bristles and yellow hairs on the front coxæ; the front tarsi twice as long as their tibiæ, the metatarsi being as long as the tibiæ; middle metatarsi as long as their tibiæ; first and second joints of hind tarsi equal.

This seems to be a southern species, Dr. Loew reporting it from Florida and Washington, D. C.; the only specimens I have seen (one female and two males) were taken by Mr. Nathan Banks at Falls Church, Va., July 10th to Sept. 26th.

#### 4 *Neurigona carbonifer* Loew.

Figure 4.

*Saucropus carbonifer* Loew, Diptera Americae Septentrionalis Indigena, ix, 84, 1869.

Thorax and abdomen yellow, the former with the flattened space in front of the scutellum black, the latter with black bands; hypopygium yellow; front tarsi with an oval tip. Length 4-5 mm.

Male: Face and palpi silvery white, the latter longer and narrower than in most species; face rather wide for a male, and with the sides nearly parallel; front and occiput black, thickly covered with white pollen; proboscis and antennæ yellow, the latter with the third joint small, arista brownish; orbital cilia and post-vertical bristles yellowish. Thorax reddish yellow, flattened space before the scutellum, a large spot on the pleuræ, another above and in front of the middle coxæ, and a small spot in front of the halteres black; a dark line between the acrostichal bristles, and sometimes along the row of bristles on either side; humeri yellowish white; bristles of the dorsum well developed, a large yellow bristle on the pleuræ above the front coxæ; scutellum pale yellow, slightly darkened at base; metanotum black. Abdomen yellow more or less distinctly banded with black on the second and third segments; first and fifth segments with yellowish hairs, the large bristles on the hind margin of the first, and the hairs on the dorsum of the second, third, and fourth segments black; venter yellow with long, yellow hairs on the fourth segment, hypopygium, its appendages, and the sheath on the venter of the fifth segment yellow. Coxæ and legs pale yellow, all the hairs and bristles of the front coxæ whitish, sometimes the larger bristles brownish in certain lights; middle coxæ with a few black hairs and bristles in front near the tip; front tarsi twice as long as their tibiæ first joint three-fourths as long as their tibiæ, the fourth joint whitish and widened at the tip, fifth joint black, flattened, forming an oval tip to the tarsi; middle metatarsi about the same length as their tibiæ; first joint of hind tarsi shorter than second, wings hyaline; veins brown; last section of fourth vein very sharply bent forward near the middle, ending before the apex of the wing, rather close to the tip of third vein.

Female: Venation the same as in the male; front metatarsi about three-fourths as long as their tibiæ; front coxæ with yellow hairs and black bristles; the bands on the abdomen narrow but sharply defined; there are no black spots on the pleuræ as in the male except the usual one in front of the halteres; and no central line on the dorsum; the flattened space before the scutellum seems to be black as in the male, but is so much injured by the pin that I cannot be sure.

Redescribed from eight males and one female, three of the males are from Prof. Aldrich's collection, two were taken at Battle Creek, Mich., and one at National Park, N. J.; this last was taken by Mr. V. A. E. Daecke; two males were in Mr. Nathan Banks' material, and were taken by him at Glencarlyn, Va.; and three were sent me by Prof. C. W. Johnson, and are from Buttonwoods, R. I., Hanover, N. H., and Cohasset, Mass.; the female is in the American Entomological Society's collection and was taken at Manayunk, Pa. The one from New Jersey was taken May 20th, the others were taken in June and July.

Note.—I have placed this single specimen as the female of this species as it agrees in all the principal characters with the male.

♂ *Neurigona nitida* n. sp.

Figure 5.

Thorax and abdomen yellow, the former shining black on the dorsum, the latter with three wide black bands. Hypopygium black, hairs and bristles of the front coxæ whitish. Length,  $4\frac{1}{2}$  mm.

Male: Face very narrow, white; palpi white; proboscis yellow; antennæ yellow, arista brownish. Front and occiput black with white pollen; frontal and post-vertical bristles black; orbital cilia white. Mesonotum reddish-yellow along the lateral margins, black on most of the disk and very shining, with a greenish reflection. Pleuræ yellow with white pollen, humeri more whitish; flattened space before the scutellum with gray pollen, scutellum yellow with a black base. The pleuræ with a black spot in front of the halteres, and another above the hind coxæ. Metanotum black, abdomen yellow with wide black bands on the dorsum of segments two, three and four, that on the second near the base and narrowed laterally, those at the base of the other two about equal width throughout; fifth dorsal segment produced anteriorly in a blunt, blackish point; the usual bilobed sheath on the venter black; hairs of the first four segments black, those of the fifth pale. Hypopygium not very large, shining black, basal part subquadrate, appendages pale yellow. Front coxæ with white hairs and bristles, middle ones with black hairs; front metatarsi as long as their tibiæ, with a row of long bristles on the bottom, continued on the next three joints; those on the metatarsi a little longer than the diameter of that joint; second and third joints fuscous, fourth and fifth a little lighter; middle metatarsi nearly as long as their tibiæ; hind tarsi with the second joint longer than the first; middle and hind tarsi infuscated from the base. Wings hyaline, tinged with brownish, darker on the front; fourth vein bent forward, ending not far from the tip of the third vein, and some distance front of the apex of the wing.

Female: Differs from the male in having only the central line between the acrostichal bristles and the flattened space before the scu-

tellum black, the central line is narrowed to a point anteriorly, hardly reaching the front of the mesonotum, the flattened space is thickly covered with white pollen; the front coxæ have pale hairs and black bristles; the front tarsi a little infuscated on the last four joints, middle ones fuscous from the tip of the first joint; abdomen with even black bands on the tergum of segments two to five.

Described from two males and one female in the collection of Prof. J. M., Aldrich taken in Polk Co., Wis., in July, by Mr. Baker; and one female in the National Museum collection taken at Franconia, N. H., by Mrs. Slosson.

#### 6 *Neurigona tridens* n. sp.

Figure 6.

Thorax dark reddish yellow, with a large three pronged black mark on the dorsum; abdomen yellow with black bands. Length 3 1-3 mm.

Female: Face silvery white; antennæ yellow; arista yellowish brown; front and occiput black with white pollen; orbital cilia white. Dorsum of the thorax dark reddish yellow on the lateral and posterior edges, and the humeri; central portion largely black, the black extending to the front of the mesonotum, and on the posterior part forming three vittæ, the central one ending in the flattened space before the scutellum, this space being also black, and the lateral vittæ not quite reaching the scutellum; pleuræ partly black, dorsum somewhat shining, thinly pollenose, the pollen thicker on the flattened space; scutellum yellow; metanotum black, abdomen yellow with broad black bands at the base of the second to fifth segments, these bands occupy more than half of the segments on the center of the tergum, but narrow laterally; venter yellow; hairs and bristles of the abdomen black. Legs pale yellow; hairs and bristles of the front coxæ black; front metatarsi four-fifths as long as their tibiæ, the remaining four joints taken together but little longer than the first; front tarsi blackened from the tip of the first joint; hind tarsi shorter than their tibiæ, the second joint longer than the first, last four joints black, contrasting sharply with the pale yellow of the first joint, but the extreme tip of the first joint brown. Wings brownish hyaline; veins dark brown; fourth vein ends in the apex of the wing rather close to the tip of the third vein.

Described from one female in the collection of Prof. J. M. Aldrich, and taken on Mt. Constitution, Orcas, Idaho, July 7, 1905.

#### 7 *Neurigona signifer* Aldrich.

*Neurigona signifer* Ald. Transactions of the Entomological Society of London, 1896, pt. 3, p. 337.

The following is a copy of the original description, as I have not seen this species.

“Male: Face very narrow, immediately under the antennæ is a triangular portion of yellow, below this there is only a narrow groove between the eyes to below the middle, from this point the face pro-

trudes as a narrow whitish wedge, slightly wider at the bottom; proboscis brownish; palpi yellow; front greenish-brown, a little dusted, converging below; antennæ yellow, third joint with a short point, arista yellow; inferior orbital cilia whitish; occiput green with white dust. Thorax dark yellow glabrous, with black bristles, acrostichal bristles small, in two rows, on each side of these in front is an area of small bristles, bounded by the humeri and the anterior margin. The flat baræ disk is a beautiful greenish-blue color, which extends to the disk of the scutellum, sides and border of the scutellum yellow; two very large bristles between two very minute ones on the border; a very large bristle behind the root of the wing; pleuræ deep yellow, imperceptably dusted, a dark spot above middle coxæ; tegulæ cilia whitish. Abdomen slender, yellow, the segments beyond the second successively shorter, the second segment bears near its front margin an opaque black band, emarginate behind in the middle, and rounded at each end. It is about half as wide as the segment. The following segments have similar bands, less emarginate, and occupying more of the width of the segments, the fifth is wholly black across the dorsum. Like the others it is yellow along the ventral sides; hypopygium shining black, turned under, club-shaped, not much exerted, the appendages not distinct. All the coxæ yellow, front ones long with black hairs and mixed brownish-yellow bristles, middle ones with black hairs, hind ones with a single bristle on the outside; legs yellow, simple, the bristles small, tarsi a little infuscated towards the tip. Wings a little yellowish, fourth vein in its last segment only very gently curved, almost perfectly parallel with the third.

Female: Face narrow, strongly protruding below, yellow, and yellow pollenose, palpi larger than in the male; third joint of the antennæ small, exceedingly short, almost kidney shaped.

Length  $3\frac{1}{2}$  mm., wing  $3\frac{4}{10}$  mm.

St. Vincent, 1500 feet altitude. Occurs also in Grenada."

Note.—*N. brasiliensis* Schin. is closely related to this species agreeing with it in coloration; it was described from a female, but it can be distinguished from *signifer* Ald. by its having a central line on the dorsum, extending from the flattened space before the scutellum about half way to the front of the thorax, this line is the same color as the flattened space; and by having the third and fourth veins much more convergent than in *signifer*.

I have seen two specimens which I refer to *brasiliensis*, one a male in the National Museum, and the other a female in the collection of Prof. J. M. Aldrich; the former is from Grenada, and the later from Vera Cruz.

8 *Neurigona maculata* n. sp.

Figure 8.

Mesonotum reddish yellow, with three black vittæ or spots; pleuræ with black spots; abdomen yellow with black bands; middle metatarsi with a row of long bent bristles below; hypopygium small, shining black. Length 4-5 mm.

Male: Face and palpi white; eyes narrowly separated at the center of the face; proboscis and antennæ yellow, arista brownish; front and occiput black, thickly covered with white pollen; orbital cilia whitish, post-vertical bristles yellowish. Mesonotum reddish-yellow with three black vittæ or spots, the central one subquadrate (in one of my specimens this spot is missing), lateral spots oval and quite variable in size; humeri yellowish white; pleuræ pale yellow with white pollen, and with a large black spot in the center, a long spot between the front and middle coxæ sometimes connected with the central spot, a small spot above the hind coxæ, and the usual small spot in front of the halteres; scutellum yellow with the extreme base black; metanotum black, a little shining, and white pollenose. Abdomen yellow with three wide black bands, one near the base of the second segment, and one at the base of the third and fourth segments, these bands widest on the center of the dorsum; fifth segment with a narrow black dorsal line and sometimes a very narrow basal band; venter yellow; fifth segment without a ventral sheath. Hypopygium and its appendages shining black, polished, rather small, and with a few scattering pale hairs. Legs pale yellow; front coxæ with delicate yellowish hairs in front, and black bristles near the tip; front metatarsi about as long as their tibiæ, the fourth joint short, about as broad as long; middle metatarsi nearly as long as their tibiæ, and with a row of long bristles on the lower side, these bristles more or less bent backwards at tips; this row of bristles continued on the tibiæ but the bristles scattering and straight; hind tarsi with the first and second joints equal. Wings grayish hyaline, a little darker in front; last section of fourth vein bent forward a little from a little beyond the center, not very close to third at tip; tip of fourth vein a little before the apex of the wing.

Female: Agrees with the male in all but sexual characters, except that it has only short scattering bristles on the lower side of the middle metatarsi; and the fourth joint of the front tarsi are longer than in the male; in one specimen the lateral spots on the dorsum of the thorax are wanting.

Described from five males and ten females from Canada, N. H., Mass., N. Y., Pa., N. C., Mich., and Wis. I have taken them in the vicinity of Buffalo, N. Y., and at Toronto, and Kearney, Ont., from June 10 to July 9; Prof. J. M. Aldrich sent me specimens from Polk Co., Wis., taken in July, from Philadelphia, Pa., taken by Mr. V. A. E. Daecke, June 12, and from Battle Creek, Mich.; Mr. Nathan Banks sent specimens

from Sea Cliff, and Ithaca, N. Y.; Prof. C. W. Johnson sent specimens from Chester, Mass., taken August 4; Brookline, Mass., June 18; Hampton, N. H., July 10, taken by S. A. Shaw, and from Lake Toxaway, N. C., taken by Mrs. Slosson; the National Museum collection has a specimen taken at Mt. Washington, N. H., by Mrs. Slosson.

### 9 *Neurigona floridula* Wheeler.

Figure 9.

*Neurigona floridula* Wheeler, Proc. Cal. Acad. Sci. ii, p. 72, 1899.

Thorax and abdomen yellow; hypopygium with the first half yellow, last half black; front tarsi plain, with the fourth joint of front tarsi less than one-half as long as third; wings tinged with yellow. Length 5 mm.

Male: Face rather wide for a male, white; palpi white; proboscis yellow; front and occiput black, thickly covered with white pollen, thinner on the center of the front; antennæ yellow, third joint a little infuscated, arista brown; frontal bristles black, orbital cilia and post-vertical bristles whitish yellow. Mesonotum yellow, shining; pleuræ paler, opaque and with a coat of white pollen, with a black line in front of the halteres; metanotum and scutellum yellow, a little shining; outer hairs of the scutellum small but distinct. Abdomen yellow, darker on the third and fourth segments; third with a narrow dark band near the posterior end, continued across the venter (sometimes this band is indistinct); dorsum of the fourth segment with a poorly defined wide blackish band; fifth light yellow; venter yellow with a transverse row of long yellow hairs on the third segment; hairs on the second, third and fourth segments mostly black, those on the first and fifth yellow, the marginal row of bristles on the first segment black; hypopygium a short oval in outline, compressed laterally, the basal part yellow, last part black or testaceous, the yellow part nearly two-thirds of the whole. Legs light yellow; front coxæ with short yellow hairs on the whole of the front and with black bristles near the tip; middle coxæ with black hairs and bristles; front and middle metatarsi about the same length as their tibiæ; fourth joint of front tarsi less than one-half as long as third; second joint of hind tarsi distinctly longer than first; tegulæ, their cilia, and the halteres light yellow. Wings hyaline, strongly tinged with yellow in front of fourth vein, third and fourth veins convergent, fourth vein ending in apex of the wing, not very close to the tip of third; veins yellowish; anal angle obsolete.

The following is a copy of Prof. Wheeler's description of the female. I give it in full for the benefit of those who may wish to study the synonymy of this species.

"Female: Length  $4\frac{1}{2}$ - $5\frac{1}{2}$  mm., length of wing  $4\frac{3}{4}$ -5 mm. Proboscis reddish yellow with pale hairs; palpi and face yellow, thickly covered with silvery white dust, the latter of the usual width for a female, and with the portion below the transverse suture receding; antennæ yellow,

third joint lacking; (I find it small and the arista brown) front and occiput black, thickly covered with silvery white dust; post-ocular cilia white; eyes green. Thorax, scutellum, and abdomen reddish yellow, covered with white dust, which is most abundant on the lateral portions of the thoracic dorsum and the pleuræ; prescutellar depression shallow; scutellum with two median long bristles and two feeble lateral bristles. Abdomen covered with short black hairs; pleuræ with a black spot below the root of the wing. Coxæ reddish yellow dusted like the pleuræ; anterior surface of the fore coxæ beset with short white hairs, and a few conspicuous black bristles near their proximal ends; similar bristles occur in a corresponding position in the middle coxæ; hind coxæ with a single bristle on the lateral surface, and a few bristles near the tip. Legs and metathoracic epimera light yellow; the femora very slender and covered with small black hairs; last joint of all the tarsi black; fore tarsi twice as long as the fore tibiæ; middle tarsi nearly twice as long as the middle tibiæ; hind tarsi scarcely as long as the hind tibiæ, hind metatarsi distinctly shorter than the succeeding joint. Wings scarcely narrowed towards the base, distinctly yellowish, and with yellow veins; apical segment of fourth vein rather sharply bent upwards near its middle, ending rather close to the tip of the third vein; posterior cross-vein about two and one-half times its length from the posterior margin of the wing, measured along the distal segment of the fifth vein. Halteres and tegulæ yellow, the latter with yellow cilia."

In the above description Prof. Wheeler states that the wings are scarcely narrowed towards the base. I find in all the species that I have seen that where the wings of the male are narrowed at base so as to leave little or no anal angle that the wings of the females are normal, and have the anal angle prominent, as is the case with this species. Male described from three specimens, one in the collection of Prof. Aldrich, taken by Mr. Daecke, at Philadelphia, Pa.; one received from Mr. Daecke and taken by him at Perdix, Pa., on June 10; the other in the National Museum collection, and taken on Mt. Washington, N. H., by Mrs. Slosson. I have seen females from the following states: Me., N. H., Vt., N. J., N. Y., Pa., Md., Del., Va., N. C., Ohio, Mich., and Canada. Prof. Wheeler also mentions Illinois.

Note.—In Prof. Aldrich's Catalogue of North American Diptera, *floridula* is placed as the female of *carbonifer*, but after careful study of the material in my hands I prefer to place *floridula* as a distinct species, and place the male described above with it, as they agree in all essential characters, except those points which usually form the sexual distinction.

10 *Neurigona floridula* var. *infuscata* n. var.

Figure 10.

Thorax and abdomen yellow, the latter with more or less distinct bands; hypopygium black, more or less yellow on the first half; front tarsi plain, and with the fourth joint more than one-half as long as the third; tip of the wing infuscated. Length,  $5\frac{1}{2}$  mm.

Male: Face rather wide for a male, somewhat narrowed in the middle, silvery white; antennæ yellow; front and occiput black, covered with white pollen; orbital cilia and post-vertical bristles yellowish white. Thorax yellow, shining on the dorsum; flattened space before the scutellum dull with yellowish pollen; pleuræ paler and covered with white pollen, a black line in front of the halteres, also a black spot in front of the middle coxæ; metanotum yellow, more or less infuscated close to the abdomen; scutellum yellow, paler below. Abdomen yellow, the first segment paler and more or less infuscated at base; second and sometimes the third segment with a distinct black band at base; fourth segment more or less infuscated, but hardly banded; sometimes the third and fourth segments almost entirely yellow; venter yellow, with a transverse black line at hind margin of third segment, this line fringed with long yellowish hairs; hairs on the dorsum of the second, third, and fourth segments black, except on the lower edges where they are more yellowish. Hypopygium black, shining, and testaceous or yellowish on the first half. Legs pale yellow; front coxæ with yellow hairs on the front side, and black bristles near the tip; hairs and bristles of the middle coxæ black; a black bristle on each middle and hind trochanter; a few yellowish hair-like bristles at base of middle femora below; one or two yellowish bristles above front coxæ; front tarsi hardly twice as long as their tibiæ, the first joint about the same length as the remaining four joints together; fourth joint less than one-half as long as the third; fifth joint black; middle metatarsi the same length as their tibiæ; first joint of hind tarsi shorter than the second; middle and hind tarsi infuscated almost from the base. Wings hyaline, strongly tinged with brown along the front, and with a distinct cloud at tip; last section of fourth vein bent forward at the middle and ending in the apex of the wing, not far from the tip of the third vein; anal angle obsolete; veins yellowish brown to brown.

Female: Differs from the male in the form of the wings, the anal angle being well developed; wings a little less tinged with brown in front, and without the cloud at tip. Abdomen without distinct bands, but sometimes darkened in spots.

Described from thirteen males, which I took at Little Valley, N. Y., June 10, 1912; and twenty females from Pa., R. I., Mass., N. Y., N. J., Mich., and Wis.

This may be a distinct species, but I cannot find any structural character to separate it from *floridula*. Both sexes are a little larger and more robust than the specimens of *floridula*

that I have seen; the male has the tip of the wing infuscated, the hypopygium is darker in color, the pleuræ have a black spot above the middle coxæ, and the wing veins are darker. The female is difficult to separate from *floridula*, but they are a little more robust, and darker in color.

#### 11 *Neurigona flava* n. sp.

Figure 11.

Yellow, with yellow pollen. Abdomen with lateral brown spots. Wings tinged with yellow. Length  $4\frac{1}{4}$  mm.

Female: Face and palpi white; antennæ yellow, the first joint paler, arista brown; front and occiput black, thickly covered with yellowish-white pollen; frontal bristles black, orbital cilia and post-vertical bristles yellowish. Dorsum, scutellum, and metanotum yellow, evenly yellow pollinose, humeri and pleuræ whitish-yellow, and yellowish pollenose, a black line in front of the halteres. Abdomen yellow, with narrow brown lateral spots on segments three and four; these spots are at the base of the segments and scarcely form bands; hairs of the abdomen mostly black. Legs pale yellow, tarsi scarcely darkened at tip, fore coxæ with yellow hairs and black bristles; second joint of hind tarsi longer than first; front and middle metatarsi three-fourths as long as their tibiæ. Wings strongly tinged with yellow, all veins bright yellow; fourth vein ends in tip of the wing, a considerable distance from the tip of the third vein.

Described from one female in Prof. J. M. Aldrich's collection, and taken at Lewiston, Idaho, on June 17, 1902.

Note.—This species may be distinguished from *transversa* by the deeper yellow pollen of the dorsum being evenly distributed; in this species the acrostichal bristles are very poorly developed, while in *transversa* they are very conspicuous. In this, the second joint of the hind tarsi are distinctly longer than the first, the wings have a strong yellow tinge and the veins are bright yellow, all of which is different in *transversa*.

From *floridula* it differs by the dense yellow pollen of the dorsum, and the third and fourth veins being much further apart, the wings are also a brighter yellow, but this character is of little use unless the student has both species before him.

#### 12 *Neurigona aldrichii*, n. sp.

Figure 12.

Thorax and abdomen yellow, the latter with black bands; hypopygium black and yellow; second joint of front tarsi shorter than the fourth, flattened, and widened at tip. Length  $3-3\frac{1}{2}$  mm.

Male: Face and palpi white; eyes contiguous; antennæ and proboscis yellow, arista brownish yellow; front and occiput dark grayish green with white pollen; orbital cilia whitish. Thorax yellow, shining;

humerali, pleuræ, scutellum, and the flattened space before paler; scutellum with a blackish spot at base; pleuræ with a black line in front of the halteres, this line sometimes broken into two spots; metanotum black. Abdomen yellow with narrow black bands near the base of segments two, three, and four, the first sometimes infuscated at base; hairs of the abdomen mostly pale; hypopygium nearly as long as segments four and five, but not very thick, first half yellow, last half black or testaceous. Legs pale yellow; front coxæ with a few yellow bristles near the tip; middle coxæ with black hairs and bristles; front metatarsi hardly as long as their tibiæ, second joint shorter than fourth, and with the apex widened and extended in the form of a short spur on top, somewhat infuscated at tip; third joint a little longer than fourth, and both with a row of short bristles below, these bristles hardly as long as the diameter of the joint; middle metatarsi about four-fifths as long as their tibiæ, fourth joint slightly flattened, fourth and fifth joints fuscous; apical half of middle tibiæ brown; hind tarsi with the first joint a little shorter than the second, and becoming fuscous from the tip of the first joint. Wings grayish hyaline; fourth vein bent forward from the center of the last section, the tip quite close to the tip of the third vein, and some distance in front of the apex of the wing.

Female: Differs from the male in having the face quite wide; the abdomen with the hind margins of segments two and three, and sometimes the bases of all the segments infuscated; the hairs and bristles of the front coxæ black; all the tarsi normal and scarcely infuscated; metanotum yellow.

Described from two males and five females, taken by Prof. J. M. Aldrich, at Lawrence, Kansas, on June 8th.

### 13 *Neurigona transversa* n. sp.

Figure 13.

Thorax reddish yellow, with three pollenose vittæ; abdomen yellow, with the hind margins of the segments pale; a narrow black line above the pronotum. Length  $5-5\frac{1}{2}$  mm.

Female: Face wide, with the sides parallel; face and palpi whitish; antennæ deep yellow, first joint paler; palpi with yellow bristles at tip; front and occiput black, thickly whitish pollenose; frontal bristles brownish yellow, orbital cilia rather long and whitish. Dorsum of the thorax reddish yellow, with three vittæ formed with yellowish pollen, the narrow central one between the acrostichal bristles has the pollen more dense, the lateral vittæ not so sharply defined. There is a bare spot above the root of the wing in each of these vittæ; metanotum, scutellum, and the flattened space in front thickly covered with yellowish pollen, which is thinner at the base of the scutellum, the pollen on the lower part of the pleuræ more whitish; the usual black line in front of the halteres; a yellow bristle above the front coxæ; front of the mesonotum with a black transverse line which is almost interrupted in the middle. Abdomen reddish yellow, slightly infuscated, and with distinct yellowish white bands on the hind margins of the segments, that

on the fifth not as distinct as on the other segments, and that on the first widest; halteres, tegulæ, and their long cilia yellowish white. Hairs and bristles of the coxæ black, except the short hairs on the front coxæ which are yellow and easily overlooked; the front and middle metatarsi about three-fourths as long as their tibiæ; tips of the tarsi infuscated; first and second joints of the hind tarsi equal. Wings grayish hyaline; fourth vein ends in the apex of the wing, the tip widely separated from the tip of the third vein; veins brown.

Described from two females taken at Moro Lake, Cal., July 23, 1911, by Prof. J. M. Aldrich.

#### 14 *Neurigona disjuncta* n. sp.

Figure 14.

Thorax and abdomen yellow, the latter sometimes with black bands; hypopygium yellow, appendages testaceous; front tarsi plane, with the fourth joint nearly two-thirds as long as the third; tip of the wing infuscated. Length,  $4\frac{1}{2}$ –6 mm.

Male: Face rather wide for a male, and with the sides nearly parallel, only a very little wider below; face and palpi with silvery white pollen; antennæ yellow, arista brown; front and occiput black, thickly white pollenose; orbital cilia and post-vertical bristles white. Thorax yellow, somewhat shining on the dorsum, but dulled with white pollen; humeri and pleuræ pale yellow, and covered with white pollen; pleuræ with the usual black spot in front of the halteres; scutellum and metanotum yellow; the flattened space before the scutellum sometimes slightly infuscated. Abdomen yellow with black or brown lateral spots on the dorsum of the second, third, and fourth segments, these spots sometimes united into bands on the third and fourth segments; venter yellow, with a black transverse ridge on the third segment. This ridge is ciliate with long whitish hairs, hairs on the venter yellowish white, those on the tergum mostly black; fifth segment short, and with the ventral sheath black and polished. Legs pale yellow; front coxæ with short yellow hairs on the front side, and large black bristles near the tip; middle coxæ with black hairs and bristles near the tip; front and middle metatarsi about as long as their tibiæ; front tarsi infuscated from the extreme tip of the first joint; fourth joint of front tarsi nearly two-thirds as long as third; middle and hind tarsi growing darker from the base to the tip, second joint of hind tarsi longer than the first. Wings grayish hyaline, with the apex more or less infuscated; third and fourth veins widely separated at tips; fourth vein ending slightly back of the apex of the wing.

Female: Agrees with the male in most characters, except the sexual difference, but the abdomen may lack the lateral spots; and the wings are not infuscated at apex, but somewhat tinged with yellow along the front.

Described from five males, and nine females, from Vt., N. Y., and Canada. I have taken them from the vicinity of Buffalo, N. Y., and also at Toronto, and Ridgeway, Ont.;

Prof. C. W. Johnson sent me one male, taken at Mt. Ascutney, July 11, and three females taken at Norwich, July 9; both places are in Vermont. The specimens that I took were found from June 6 to July 4.

Note.—The male of this species in general appearance resembles the male of *floridula* var. *infuscata*, but can be readily separated by the difference in venation and the greater relative length of the fourth joint of the front tarsi to the third.

I have in my collection seventeen females that seem to be a variety of this species, they were taken at East Aurora, N. Y., June 15th and 22d, 1912. They are somewhat smaller, ( $3\frac{1}{2}$ –4 mm.), and paler; some of them have sharply defined black bands on the abdomen; the third and fourth veins approach each other a very little more than in the typical forms, the fourth vein ending exactly in the apex of the wing.

There are two females in Prof. Aldrich's collection that seem to be the same as the above variety. They were taken at Battle Creek, Mich., and Ithaca, N. Y.

### 15 *Neurigona viridis* n. sp.

Figure 15.

Thorax bright metallic green, sometimes coppery on the dorsum; abdomen mostly dark metallic green, with the first two segments partly yellow; hypopygium black, polished; front tarsi with the fourth and fifth joints a little flattened; wings with the third and fourth veins nearly parallel. Length,  $3\frac{1}{2}$ –4 mm.

Male: Eyes contiguous on the center of the face for some distance, leaving only a small triangle above and below; face and palpi silvery white; palpi rather large and with yellowish bristles at tip; proboscis yellow; front and occiput dark metallic green, with white pollen; antennæ deep yellow, the third joint a little brownish at tip, arista brown; frontal bristles black, orbital cilia and post-vertical bristles whitish. Thoracic dorsum bright shining green, sometimes with coppery reflections, and a little dulled with whitish pollen; pleuræ dark greenish, the ground color partly concealed by grayish white pollen; scutellum bright green on the disk, yellow below and usually on the lateral angles; metanotum darker green with white pollen. Abdomen with the first two segments yellow, a large dark greenish spot on the dorsum of the second, which sometimes covers most of it; the following segments dark metallic green or greenish black, with the posterior edges yellow and thickly covered with white pollen, in some specimens these edges very narrow; hairs of the abdomen mostly pale, and those on the hind margins of the segments rather long; hypopygium rather large, black, polished, and with a pair of long whitish appendages on the posterior margin. Legs pale yellowish; the hairs and bristles of the front coxæ

whitish, the bristles more brownish in certain lights; middle coxæ with black hairs and bristles; front and middle metatarsi shorter than their tibiæ; fourth joint of front tarsi flattened, fifth also slightly flattened; second joint of hind tarsi about one and one-third times as long as the first; tegulæ, their cilia, and the halteres pale yellowish. Wings grayish hyaline, last section of fourth vein only feebly bent and slightly approaching the third, fourth vein ends in the apex of the wing; veins dark brown, yellow at the root of the wing.

Female: Like the male in general characters but the front tarsi are plain, the face narrow, with its sides parallel, the hairs of the front coxæ black, and the abdomen with more yellow.

Described from four males and six females from N. H., N. Y., and Va. I took the four males and two females at South Wales, Erie Co., N. Y., July 9, 1911; two of the females are from Mr. Nathan Banks, and were taken at Glencarlynn, Va., July 23; two females are in the National Museum collection, one from the White Mountains, N. H., and the other was reared by Mr. James Angus from larvæ feeding in rotten wood of hickory, at West Farms, N. Y., the imago issued May 9, 1884.

#### 16 *Neurigona decora* Aldrich.

*Neurigona decora* Aldrich, Kansas University Science Bulletin, Vol. 1, p. 83, 1902.

"Male: Eyes barely contiguous on the upper part of the face, slightly separated above and below; front broad, opaque, dark; antennæ small, red, the tip of the third joint brownish; orbital cilia pale. Thorax bright, shining blue, the concavity before the scutellum more bronze; pleuræ green, with thin dust, and the hind margin yellow; tegular cilia yellowish. Abdomen rather short, the first two joints yellow, the rest dark green, shining above. Hypopygium rather prominent, exserted, yellow. Coxæ yellow, the middle ones dark at base; remainder of legs and tarsi yellow; a slender hair on the outer side of the second joint of fore tarsus at its apex. Wings a little yellowish; the fourth vein converges toward the third at the end, terminating before the apex of the wing.

"Female: Face linear; eyes not contiguous.

"Length 2.8 to 3 mm. Two males, two females. One of the latter is from St. Vincent, but was not mentioned in the previous paper."

I have copied the above from Prof. Aldrich's paper on the Dolichopodidæ of Grenada.

17 *Neurigona arcuata* n. sp.

Figure 17.

Thorax greenish; abdomen yellow, with black bands; hypopygium small black; wings with the costa much arcuated, and with a brown cloud along the front; front tarsi with the fourth and fifth joints black, the fifth joint nearly at right angles to the fourth. Length of male,  $3\frac{3}{4}$  mm.; of female,  $3\frac{1}{2}$ – $3\frac{3}{4}$  mm.

Male: Face silvery white, not very narrow for a male, but somewhat narrowed in the middle; proboscis yellow; front and occiput greenish, thickly covered with white pollen; frontal bristles black, orbital cilia whitish; antennæ yellow, arista brownish. Mesonotum metallic green, somewhat shining but dulled with grayish pollen, the narrow space between the acrostichal bristles more shining and without pollen; humeri and posterior angles of the dorsum yellow; pleuræ black, thickly covered with white pollen; scutellum yellow; metanotum black, a little shining, and with white pollen. Abdomen yellow, dorsum of segments two to four with wide black bands; the fifth segment has a narrow black band; hairs of the abdomen mostly yellow, including the long bristles on the hind margin of the first segment; hypopygium small, black or testaceous, polished, appendages lighter testaceous, or sordid yellow. Legs pale yellow, front coxæ bare with a few yellow bristles near the tip; middle coxæ with black hairs and bristles; front femora with a few long yellow hairs near the tip on the outside; fourth joint of front tarsi not much more than one-half as long as third, shorter than fifth, and with a few long black hairs at tip, fifth joint and most of fourth black, fifth joint nearly at right angles to fourth; front metatarsi fully three-fourths as long as their tibiæ; middle tarsi with the second, third, and fourth joints slightly flattened, becoming black from the middle of the second joint, and with the metatarsi nearly as long as their tibiæ; middle tibiæ more or less infuscated in the center; first and second joints of the hind tarsi about equal. Tegulæ and their cilia pale yellow. Wings with the costa much arcuated; posterior margin indented at the apex of the fifth vein; third vein curved backwards towards the fourth; last section of the fourth vein curved forwards from a little beyond the middle in such a manner as to be nearly parallel with the third at tip; a brown cloud along the front of the wing, from about the tip of the first vein to the tip of the third, fading out back of third vein, and widest in the middle; veins brown, yellow at the base of the wing.

Female: Agrees with the male except in the following points; all the tarsi become fuscous from the middle of the second joint; front femora have no long hairs at tip; wings with the costa less arcuated, and without distinct cloud, but the front of the wing is slightly tinged with yellowish brown; the middle tarsi slightly flattened as in the male but less so; front tarsi plain; second joint of the hind tarsi longer than the first.

Described from five specimens taken by me at Kearney, Ont., July 3, 1909; and many specimens taken in the vicinity of Buffalo, N. Y., June 6th to July 4th.

18 *Neurigona deformis* n. sp.

Figure 18.

Thorax black; abdomen yellow with black bands; hypopygium black, small; three joints of the front tarsi flattened; wings with the costa and third vein much arcuated, and with a brown cloud along the front towards the tip. Length of male 6-6½ mm., of female 5½ mm.

Male: Face not very narrow for a male, but narrowest in the center, and silvery white; front and occiput black, covered with white pollen, which is thickest on the front and upper part of the occiput; antennæ yellow, the rather long arista brownish; frontal bristles black; orbital cilia and post-vertical bristles yellowish. Thorax black, rather shining on the dorsum, thinly dusted with white pollen, this pollen much thicker along the front, on the sides, and between the acrostichal bristles; the pollen on the flattened space before the scutellum thick and somewhat greenish; pleuræ covered with white pollen, which almost conceals the ground color; humeri, posterior angles of the dorsum, space between the front coxæ, and metathoracic epimera yellow; scutellum black on the disk, yellow beneath, which color extends somewhat onto the edge of the disk; metanotum black with white pollen. Abdomen yellow; second to fifth segments with black bands at base, those on the second and third segments widest on the center of the tergum, narrowing to a point on the lateral sides; hairs on the dorsum of the second and third segments mostly black, those on the rest of the abdomen and the long bristles on the margin of the first segment yellow; hypopygium black, polished, and with its appendages more or less testaceous; sheath on the venter of the fifth segment corrugated, and opaque black. Legs long and slender, pale yellow; front coxæ with minute yellow hairs on the front, and several yellow and one or two black bristles near the tip; middle coxæ with a few black hairs and bristles near the tip; front femora with about ten long yellow hairs on the outside near the tip; middle femora nearly bare except near the tip; front metatarsi about the length of their tibiæ; second, third, and fourth joints of front tarsi flattened, bare on the sides, ciliate with black hairs on the edges, the longer hairs on the top edge longer than the width of the third joint, those on the lower edge very short, last two joints of front tarsi infuscated; middle metatarsi about equal to their tibiæ in length; middle trochanters with a black bristle; first and second joints of hind tarsi nearly equal; middle and hind tarsi black; hind tibiæ infuscated. Halteres, tegulæ, and their cilia pale yellow. Wings narrowed at the base, and with the costa much arcuated, the swell starting just before the middle; hind margin indented at the tip of the fifth and sixth veins; third vein much arcuated; last section of fourth vein nearly in a straight line with the basal part; wings hyaline, with a brownish cloud along the costa, beginning at the same point as the swell and extending to the tip of the fourth vein, fading out behind; a narrow faint cloud may be traced along the fifth, and last section of the fourth vein; veins pale yellow at the base of the wing, becoming brown on the disk.

Female: Wings with the costa nearly straight, the cloud less distinct than in the male, the whole wing being tinted with brownish in front of the third vein, and slightly clouded along the fifth vein; front tarsi plain, otherwise as in the male.

Described from four males and six females, from western N. Y. and Ont. I took the males and five females near Buffalo, N. Y., and one female at Kearney, Ont., July 8th; those taken near Buffalo were captured between June 6th and 15th.

Note.—This species is closely related to *arcuata*, but may easily be separated by its size, (this being the largest species taken so far in North America) the form of the front tarsi, and the wings, the latter being almost deformed.

### 19 *Neurigona tenuis* Loew.

Figure 19.

*Saucropus tenuis* Loew, Mon. N. A. Diptera ii, p. 228, 1864. Described from the female. The male was described by Prof. Wheeler in the Proc. Cal. Acad. Sci., ii, p. 73, 1899.

Mesonotum green; abdomen yellow, with black bands; hypopygium black, large; front tarsi about the same length as their tibiae and with an oval tip. Length  $3\frac{1}{2}$ –4 mm.

Male: Face and palpi white; eyes contiguous at the center of the face; proboscis yellow; front and occiput greenish gray, sometimes quite dark, thickly covered with white pollen; frontal bristles black, orbital cilia and post-vertical bristles pale yellow; antennae yellow, the third joint sometimes brownish, arista brown. Dorsum of the thorax light verdigris-green, shining, dulled with thick grayish pollen, that on the flattened space before the scutellum a little yellowish; humeri and more or less of the lateral edges yellow; pleurae greenish gray, with more or less yellow below, in some specimens nearly all yellow, covered with white pollen; scutellum green on the disk, with a rather wide margin of yellow; metanotum greenish gray, becoming dark brown in some individuals, white pollenose. Abdomen yellow with wide black bands on segments two, three, and four; those on the second and third narrowed laterally so as to form nearly triangular spots; fifth mostly or entirely black; first more or less brown on the dorsum; venter yellow on the basal segments, more brown or blackish toward the posterior end; hairs of the abdomen mostly black, with more pale hairs posteriorly, on the fifth segment they are altogether pale; those on the ventral surface of the fourth and hind part of third long; hypopygium black, basal part somewhat shining but dulled with white pollen, apical part, and appendages shining, polished. Legs pale yellow; front coxae long and slender, with minute scattering hairs on the front side, and a few yellow bristles near the tip; middle coxae with a very few black hairs or bristles near the tip, and a few yellow hairs at tip inside, these hairs curled inwards; hind coxae usually blackened a little at tip on the inside; middle and hind femora with a few bristles on the inside near the base, those on the middle ones black, on the hind ones yellow; front meta-

tarsi about three-fourths as long as their tibiæ, and about one and one-fourth times as long as the remaining joints together; second and third nearly equal; fourth and fifth fringed on each side with long black hairs, which form a flat oval tip to the tarsi, this tip a little longer than wide; fourth joint except base, and fifth black; first joint of hind tarsi a very little longer than the second; middle metatarsi about three-fourths as long as their tibiæ. Tegulæ, their cilia, and the halteres pale yellow, the latter with a brown dot on one side at the base of the knob. Wings grayish hyaline; third vein slightly bent backward at tip; fourth vein bent forward from just before the middle of the last section, but the tip not very close to the tip of the third.

Female: Agrees with the male except that the front tarsi are plane, with the metatarsi a little shorter than their tibiæ, and more than twice as long as second joint; first and second joints of hind tarsi about equal; the mesonotum often nearly all yellow, except the flattened space before the scutellum.

Redescribed from many specimens taken in the vicinity of Buffalo, N. Y. This is the most abundant species of *Neurigona* around Buffalo, I have taken nearly one hundred specimens the past summer, the first on July 9th, and the latest on September 8th; the only other specimen I have seen is a male form Mt. Tom, Mass., taken July 14th, and sent to me by Prof. C. W. Johnson. Loew's Mon. gives Middle States as the habitat.

Note.—Prof. Wheeler in his description of the male of *tenuis* mentions a row of hook-like spines along the lower surface of the front tibiæ, also curved spines on the front matatarsi; I cannot detect these in our eastern specimens, although there is a row of very minute bristles or stout hairs on the lower surface of the front tibiæ that I have not mentioned in the description I have given above, because they are so easily overlooked that they are of little value in separating the species, but in the closely related western species that I am describing under the name of *pectoralis* these bristles are a conspicuous character. The males of these two species are so nearly alike in general appearance that he may have confused them. They may be separated by the front tarsi of *tenuis* being nearly as long as their tibiæ, while in *pectoralis* the tarsi are much shorter than their tibiæ; in *tenuis* also the front legs are infuscated from, or before the middle of the tibiæ, in *pectoralis* there is no infuscation of the front legs except the enlarged tip of the tarsi which is black; *pectoralis* has the first and second joints of the hind tarsi equal, while in *tenuis* the first joint is a little the longest; the middle coxæ of *pectoralis* have yellow bristles which are not found in *tenuis*.

20 *Neurigona pectoralis* n. sp.

Figure 20.

Dorsum of the thorax metallic green; abdomen yellow with black bands; front tarsi much shorter than their tibiae and with the last two joints flattened and fringed forming an oval tip; hypopygium black, rather large. Length 4 mm.

Male: Eyes very narrowly separated; face and palpi covered with white pollen; proboscis yellow; front and occiput light metallic green, the front thinly and the occiput more thickly covered with white pollen; antennae yellow, arista yellowish brown; frontal bristles black, orbital cilia and post-vertical bristles whitish. Dorsum of the thorax light verdigris green, with yellowish pollen; pleurae black with whitish pollen; humeri yellowish; scutellum yellow, with the base dark metallic greenish blue; metanotum black, with white pollen. Abdomen yellow, first segment more or less infuscated, second and third segments with black bands, which are widest on the center of the dorsum, and are narrowed laterally, hardly reaching the lower sides of the abdomen; fourth segment with only the hind margin yellow, fifth entirely black except a narrow white hind margin, interrupted on the center of the dorsum, and reaching about half way to the lateral sides; hairs of the abdomen mostly black on the dorsum, those on the lower part of the sides pale. Hypopygium black, rather large, rounded behind, the first half but little shining, appendages black or testaceous. Legs pale yellow; front and middle coxae with only yellowish hairs and bristles on the front side; front pair rather long, middle and hind coxae slightly darkened on the outside; front tibiae about one and one-fourth times as long as their femora, and the front tarsi hardly as long as their femora; metatarsi a little longer than the four remaining joints together, second and third joints nearly equal and very slightly flattened, fourth and fifth black, flattened and fringed on each side with black hairs, forming a nearly round tip to the tarsi; front tibiae and metatarsi with a row of small, hook-like bristles below; middle femora with a few black bristles near the base below; middle metatarsi about four-fifths as long as their tibiae; first and second joints of the hind tarsi of nearly equal length, hind tarsi shorter than their tibiae; halteres, tegulae, and their cilia pale yellow. Wings grayish hyaline, fourth vein ending in the apex of the wing; tips of the third and fourth veins quite widely separated.

Female: Agrees with the male, except that the hairs and bristles on the front of the middle coxae are all black; the middle metatarsi are hardly three-fourths as long as their tibiae, and the front tibiae are about the same length as their femora and much shorter than their tarsi which are plane, and have the last joint blackened.

Described from two males and two females from N. M. in the National Museum collection, the two males and one female were taken by H. S. Barber, at Las Vegas, N. M., Aug. 7th, 9th and 13th; and the other female was taken by Townsend on the White Mountains, N. M., at 6500 feet altitude.

Note.—Under *tenuis* I have given the characters that separate the males of these two species; the females of these species can be distinguished from those of *tenuis* in having only the humeri yellow, the pleuræ being altogether black, and the dorsum dull greenish, while in *tenuis* there is more or less yellow on the dorsum and pleuræ.

21 *Neurigona æstiva* n. sp.

Figure 21.

Thorax blackish; abdomen yellow with black bands; hypopygium black with the upper part more or less yellow; front tarsi plane. Length  $5\frac{1}{2}$  mm.

Male: Face narrow, of nearly equal width throughout, face and palpi silvery white; proboscis and antennæ yellow, the latter with the third joint very small; arista brown; front and occiput blackish, but the ground color concealed by white pollen; orbital cilia whitish; post-vertical bristles yellow. Thorax and metanotum blackish with white pollen, shining on the dorsum, pollen thickest on the pleuræ and the flattened space before the scutellum; humeri, a large spot at the insertion of the wings, and the scutellum except the base yellow; metathoracic epimera yellowish white; most of the bristles of the dorsum small and weak, the acrostichal bristles can hardly be traced in some individuals, but in others they are distinct. Abdomen yellow, the first segment more whitish; second segment with a black band near the base; third with a black band at the base; fourth black at base getting paler posteriorly; fifth segment dusky yellow, with the ventral sheath large and black; hairs of the abdomen and the bristles on the hind margin of the first segment yellow, those on the lower part of the fourth segment long; hypopygium mostly black or testaceous, shining, sometimes the first half partly yellowish. Legs yellowish white; hind femora more yellowish; hairs and bristles of the front coxæ all whitish, those of the middle coxæ black; front tarsi more than twice as long as their tibiæ, their metatarsi hardly as long as the tibiæ, and about equal to the second and third joints taken together; middle metatarsi four-fifths as long as their tibiæ; second joint of the hind tarsi longer than the first; all the tarsi slightly darker towards the tip. Wings hyaline, slightly tinged with yellowish along the front; third and fourth veins quite widely separated at the tips; fourth vein ending in the apex of the wing.

Described from three males from N. Y., Md., and Vt. I took the type specimen at Lancaster, N. Y., June 2, 1912; Prof. C. W. Johnson has sent me one which was taken at Norwich, Vt., July 7, 1908; and there is one in the National Museum collection taken on Plummers Island, Md., May 11, 1905, by Mr. Schwarz.

22 *Neurigona bivittata* n. sp.

Figure 22.

Thorax dark reddish yellow, almost brown, with thick gray pollen, and two brown vittæ. Abdomen yellow banded with black. Length 5 mm.

Female: Face broad, whitish pollenose, the yellow ground color showing through in the specimens before me, especially below the suture, antennæ with the first two joints pale yellow, the third more orange yellow, arista brown; front and occiput black, thickly white pollenose; orbital cilia whitish. Dorsum of the thorax dark reddish yellow, almost brown, and somewhat livid, but so thickly covered with gray pollen as to hide the ground color in unrubbed specimens, humeri pale yellow, there are two brown vittæ running from the front of the mesonotum to the flattened space before the scutellum. They are just outside of the acrostichal bristles, leaving the space between these bristles gray pollenose; these vittæ are wider posteriorly and not so sharply defined; pleuræ blackish with a reddish or livid tint, and thickly covered with white pollen; scutellum pale yellow; metanotum black with white pollen. Abdomen yellow with black bands at the base of second to fifth segments, these bands narrowed laterally, and emarginate at the center of the dorsum; venter yellow; hairs of the abdomen black; the long bristles on the first segment have a yellowish color in some lights. Legs pale yellow; front coxæ with very short hairs on the front side, which appear dark colored, and with one yellow and several brown bristles near the tip, the brown bristles having more or less of a yellow color in certain lights; middle coxæ with black hairs and bristles which are more abundant than in some species; front femora, tibiæ, and metatarsi about equal in length, the last four joints of the front tarsi together about the same length as the metatarsi; middle metatarsi shorter than their tibiæ; hind tarsi about equal to their tibiæ in length, the second joint distinctly longer than the first; last joint of all the tarsi slightly infuscated. There are the usual whitish bristles above the front coxæ. Wings grayish hyaline; veins yellowish brown; anal angle not prominent; tips of the third and fourth veins well separated, the fourth ending in the tip of the wing. Halteres short, with the knob large.

Described from two females. The type specimen is labeled Colorado; the other is from Bear Lake, B. C., and was taken by R. P. Currie, July 20, 1903; both of these specimens are in the National Museum collection.

23 *Neurigona tarsalis* n. sp.

Figure 23.

Thorax black; abdomen yellow with three black bands; hypopygium yellow and black; third joint of front tarsi pure white, fourth and fifth joints black and flattened. Length  $4\frac{1}{2}$  mm.

Male: Face narrow in the center, a little wider above and below; face and palpi silvery white; proboscis and antennæ yellow, arista brown; front and occiput black, thickly covered with white pollen; orbital cilia

and post-vertical bristles yellowish. Dorsum of the thorax black, and thickly covered with white pollen, which generally forms two obscure narrow stripes; pleuræ black, covered with white pollen; prothorax, humeri, and metathoracic epimera yellowish white; scutellum pale yellow, black at base; metanotum black. Abdomen yellow, with the first segment and the posterior edges of the second, third, and fourth, and the venter paler; second, third, and fourth segments with wide black bands at base, that on the second narrowed laterally; fifth segment yellow with a polished black sheath on the venter; third segment with a black transverse line on the venter, this line near the middle of the segment and fringed with long whitish hairs; hairs of the abdomen mostly pale; the long bristles on the hind margin of the first segment black; hypopygium rather large, basal half yellow, the remaining part black and polished. Legs pale yellow; front coxæ with delicate pale hairs on the front side, and black bristles near the tip; middle coxæ with black hairs and bristles; middle trochanters with a black bristle below, and a black spot above; front metatarsi a little shorter than their tibiæ, the third joint as long as the fourth and fifth together, fourth nearly twice as long as fifth, third a little enlarged, snow white, and with white hairs; fourth and fifth black, flattened, and fringed with black hairs; middle metatarsi about the length of their tibiæ; second joint of hind tarsi a little longer than the first. Wings hyaline; tips of the third and fourth veins not very close together.

Female: Differs from the male in having the face quite wide, the front tarsi plane, middle trochanters without the black spot, fifth segment of the abdomen with a black band, wings tinted with yellowish along the front and the dorsum of the thorax more greenish.

Described from twelve males and twelve females, from N. Y., Pa., and Mich. I have taken sixteen specimens at East Aurora, Erie Co., N. Y., from June 11-15. Mr. Nathan Banks took one at Sea Cliff, N. Y. Prof. J. M. Aldrich sent me specimens from Battle Creek, Mich., and Pa.

#### 24 *Neurigona lienosa* Wheeler.

*Neurigona lienosa* Wheeler, Proc. Cal. Acad. Sci. 3d series, 2, p. 72, 1899.

Length  $4\frac{3}{4}$  mm., wing  $3\frac{3}{4}$  mm.

"Proboscis yellow; palpi and face yellow, covered with silvery white dust, the latter of the usual breadth for a female; antennæ yellow, the small third joint with a blunt point, and covered with dark pubescence; arista distinctly pubescent; front and occiput metallic green, thickly covered with white dust; postocular cilia snow white. Thorax dull metallic green, the ground color almost hidden under a thick coating of brown dust; dorsal bristles prominent along the interior border of the thorax; scutellum slightly lighter metallic green, but also with a covering of dust, the scutellum bears two strong mesial, and two weak lateral bristles; first abdominal segment dark brown, succeeding segments black, dusted with white, posterior edges of second, third, and fourth segments, and venter yellow, ovipositor yellow at the base, tip

black, with delicate hairs; pleuræ blackish metallic green, thickly covered with white dust; metathoracic epimera dark brown. Coxæ yellow, fore and middle pairs with prominent black bristles on their anterior surface near their tips, hairs on upper portion of fore coxæ delicate and pale, hind coxæ with a single black bristle on its outer surface. Legs pale yellow, with black hairs, tarsi infuscated towards their tips, fore tarsi scarcely twice as long as the fore tibiæ, middle ones one and one-third times as long as the middle tibiæ, hind tarsi scarcely as long as the hind tibiæ, hind metatarsi distinctly shorter than the succeeding joint. Wings grayish hyaline with a yellowish tinge, broader in the middle, slightly narrowed towards the base; distal segment of fourth vein moderately bent forwards near its middle and ending not very close to the third vein; distal segment of fifth vein nearly two and one-half times as long as the posterior cross-vein. Halteres and tegulæ dark brown, the latter with pale cilia."

I have not seen this species and have copied this from Prof. Wheeler's description, which was made from a single female specimen taken sweeping in pine woods at Monterey, Cal., July 22, 1896.

### 25 *Neurigona lateralis* Say.

Figure 25.

*Medeterus lateralis* Say, Proc. Acad. Nat. Sci. Phila., Vol. vi, p. 169, 1829; Compl. Works, ii, p. 362.

*Saucropus superbiens* Loew, Mon. N. A. Diptera, ii, p. 227, 1864; Neue Beitr., vol. viii, p. 76, 1861.

*Dactylongia gracilipes* Aldrich, Kans. Univ. Quat., vol. ii, p. 151, 1894.

Thorax verdigris green; abdomen yellow with more or less brilliant metallic green; hypopygium yellow; front metatarsi longer than their tibiæ remaining joints very short; first joint of hind tarsi longer than second. Length of male 2-3 mm., female  $2\frac{1}{2}$ - $3\frac{1}{2}$  mm.

Male: Face narrow, silvery white, its sides nearly parallel; palpi and proboscis yellow; antennæ yellow, third joint a little infuscated, arista dark brown; front blackish, occiput greenish, both thickly covered with white pollen; frontal bristles black, orbital cilia whitish. Thorax dark verdigris green, somewhat coppery on the sides, grayish pollenose, except a narrow central line between the acrostichal bristles; scutellum more blue green, thickly gray pollenose; pleuræ and metanotum greenish black with whitish pollen; metathoracic-epimera yellow. Abdomen yellow on the venter and lateral margins, generally the dorsum of the first segment more or less yellow, fifth yellow on the hind margin, and usually some of the incisures yellow, the rest brilliant metallic green, or blue green, rarely coppery, sometimes the green reduced to lateral spots, in one female before me there is scarcely a trace of green, but four lateral coppery spots; hairs of the abdomen pale; hypopygium rounded, yellow, with whitish appendages. Legs pale yellow; all the fifth tarsal joints black; front coxæ with long delicate yellowish hairs on the front, and a few yellowish bristles near the tip, these bristles blackish in certain lights; middle coxæ nearly bare; front metatarsi longer than

their tibiae, remaining four joints together about one-fifth, or one sixth as long as the first, third and fourth not much longer than broad, second about the length of the two following, the third with a long hair at tip; middle metatarsi about as long as their tibiae; first joint of hind tarsi longer than the second. Wings hyaline, little tinged with grayish; third vein only slightly curved at tip, last section of fourth vein approaching third from the cross-vein slightly sinuous, the tip not far from the tip of third, ending in front of the apex of the wing.

Female: Front tarsi normal, with the first joint about three-fourths as long as their tibiae, front coxæ with yellow hairs and black bristles; first and second joints of hind tarsi about equal; otherwise as in the male.

Redescribed from many specimens. Ont., Que., N. H., Mass., Fla., Ind., Mich., Ill., S. D., and Washington, D. C.; taken during June, July, and September.

Note.—Dr. Loew in his description of this species says that the upper orbital cilia are black, but I can see only pale cilia in the specimens I have examined.

### 26 *Neurigona setosa* n. sp.

Figure 26.

Thorax dull green; abdomen yellow with black bands; hypopygium yellow; middle and hind coxæ with a prominent black bristle on the outside. Length 3-3¼ mm.

Male: Face narrow, of nearly equal width and silvery white; front and occiput greenish with white pollen; antennæ yellow, third joint and arista dark brown. Thorax dull greenish with yellowish pollen; the flattened space before the scutellum poorly defined, and with a depressed line in the center; pleuræ black with white pollen; humeri, meta-thoracic epimera, halteres, and the root of the wing yellow; scutellum dull green with yellowish pollen, with the lower edge yellow, and a slightly elevated central ridge on the disk; metanotum black with white pollen; acrostichal bristles distinct, in two rows. Abdomen yellow; second segment with a very narrow, the third with a wider metallic greenish black band on the hind margin; fourth and fifth segments entirely metallic greenish black; venter yellow; hairs of the abdomen yellow; the black bristles on the hind margin of the first segment rather short; fourth and fifth segments ciliate with long yellow bristles on the lower lateral edges, these bristles more brown in certain lights; hypopygium yellow, brownish on the basal edge, with several yellow and two black appendages, the latter curved, mandible like, with a blunt triangular tooth on the inner edge near the center, and with long yellow hairs on the outside. Coxæ and legs yellow; hairs and bristles on the front side of the front and middle coxæ yellow; middle and hind coxæ each with a large black bristle on the outside; middle and hind femora each with a black bristle near the tip on the outside; middle femora ciliate with short yellow bristles on the lower surface towards the

base; tarsi scarcely infuscated at tips; front tarsi longer than their tibiæ; front metatarsi little more than one-half as long as their tibiæ; middle metatarsi two-thirds as long as their tibiæ; second joint of hind tarsi longer than first. Wings grayish hyaline, veins yellowish brown; posterior cross-vein less than twice its length from the wing margin measured on fifth vein; fourth vein gradually approaching third, ending before the apex of the wing, not far from the tip of third vein.

Female: Agrees with the male in most of the characters given, except in the following points; there are several black bristles near the tip of the front coxæ; abdomen with a row of black bristles on the hind margin of each segment; fourth and fifth segments of the abdomen, and the middle femora without cilia.

Described from four males and four females in the collection of the American Entomological Society, taken at Alamogordo, N. M., May 8-15, 1902. Type No. 5258.

Note.—I place this species in this genus for the present, but it differs from the other species of the genus by having the flattened space before the scutellum less distinctly defined; by the greater development of the appendages of the hypopygium; and by the bristles on the outside of the middle coxæ, and near the tip of the middle and hind femora; also the abdomen of the male is shorter and stouter than in most species of the genus.

### 27 *Neurigona tibialis* n. sp.

Figure 27.

Thorax yellow, with more or less greenish gray on the dorsum; abdomen yellow with black bands; hypopygium yellow, and very small; front tibiæ with a row of bristles above; wings with the third and fourth veins nearly parallel. Length  $2\frac{1}{2}$  mm.

Male: Face and palpi with white pollen, the former very wide for a male; antennæ yellow, first joint short and with three or four hairs above; third joint missing; front and occiput dark greenish gray, with white pollen; post-vertical bristles and some of the upper orbital cilia black, the lateral and lower orbital cilia whitish. Thorax yellow, with dark greenish gray on the center of the dorsum, which almost forms three broad vittæ, lateral ones abbreviated in front, and all somewhat united; pleuræ with a black spot above the middle coxæ, and another in front of the halteres; scutellum and metanotum dark greenish gray, the former yellowish below; acrostichal bristles rather long but scattering, forming two poorly defined rows. Abdomen yellow, incisions black on the dorsum, this black extending forward so as to almost connect along the center of the dorsum on the second, third, and fourth segments; fifth segment all black on the dorsum and with a greenish luster; venter yellow; hypopygium dark yellow, very small, and with two pair of short, slightly hooked appendages. Legs pale yellow; front coxæ with pale yellow hairs and bristles, the larger bristles blackish in certain lights; middle coxæ with black hairs and bristles, one of the

latter rather long and placed high up almost on the outside; hind coxæ with one black bristle on the outside; front tibiæ with a row of black bristles above, these bristles do not reach either the base or apex; front tarsi about one and one-half times as long as their tibiæ, the metatarsi two-thirds as long as the tibiæ, second joint half as long as the first; middle tarsi a little longer than their tibiæ, the first joint one-half as long as the tibiæ; middle and hind femora with a black bristle near the tip on the outside; hind tarsi fully as long as their tibiæ, with the second joint longer than the first. Wings grayish hyaline; third and fourth veins only very slightly convergent at the tips.

Described from one male which I took at Lancaster, Erie Co., N. Y., on Aug. 15, 1909.

Note.—This species resembles *setosa* in having a bristle on the outside of each middle and hind coxæ, and near the tip of each middle and hind femora; also in having bristles on the hind margin of all the segments of the abdomen. The hypopygium is smaller than that of any other species of the genus that I have seen. There are three or four bristly hairs on the top of the first joint of the antennæ near the tip, but this joint is hardly hairy on top in the same way that it is in some of the genera of Dolichopodidæ.

### 28 *Neurigona ciliata* n. sp.

Figure 29.

Dorsum of the thorax black; abdomen yellow with black bands; hypopygium small, black; front tarsi black, fringed on each side with short black hairs; wings strongly tinged with brown in front of the third vein. Length  $4\frac{1}{2}$  mm.

Male: Face and palpi silvery white, the former very narrow, the eyes almost touching on the center of the face; proboscis and antennæ yellow, arista yellowish brown; front and occiput greenish gray, with white pollen; frontal bristles black, orbital cilia and post-vertical bristles whitish. Thorax black, shining on the dorsum, with white pollen, this pollen thickest on the flattened space before the scutellum; humeri, prothorax, lateral edges of the dorsum, scutellum except base, metathoracic-epimera, and a large triangular spot above the middle coxæ yellow. Abdomen yellow, with poorly defined, wide black bands on the dorsum at the base of segments two, three, and four, and a small spot at base of fifth; hairs black on the first four segments, pale on the fifth and on the venter; venter yellow; hypopygium small black shining, appendages testaceous. Legs pale yellow; front coxæ with pale hairs and bristles, one or two of these bristles black; middle coxæ with black hairs and bristles; front tarsi black, fringed on each side with short coarse, dense hairs, giving them the appearance of being flattened, these hairs hardly as long as the diameter of the tarsi; front metatarsi about equal to their tibiæ in length, fourth joint hardly twice as long as wide; middle metatarsi four-fifths as long as their tibiæ; middle legs

infuscated from the middle of the tibiae, the tarsi becoming black; first and second joints of hind tarsi equal, black from the tip of the first joint. Halteres, tegulae and their cilia pale yellow. Wings brownish hyaline, much darker in front of the third vein; veins dark brown; third vein bent backwards at tip, fourth vein bent forwards from beyond the middle of the last section, the tips of third and fourth quite near together.

Described from one male taken at Doe Bay, Wash., July 16, 1909, in the collection of Prof. J. M. Aldrich.

29 *Neurigona perbrevis* n. sp.

Figure 30.

Dorsum of the thorax grayish green, with three brownish vittae; abdomen black; hypopygium black, polished, and rather large; front tarsi with the last two joints flattened and fringed, forming an oval tip; front tibiae longer than their tarsi. Length  $3\frac{3}{4}$  mm.

Male: Face rather narrow; face and palpi white; front and occiput seem to be black, but the ground color concealed by whitish pollen; orbital cilia white; antennae yellow, the small third joint and the arista brownish. Dorsum of the thorax grayish green, thickly covered with pollen, (this pollen and that of the head and scutellum has a greenish tint). Dorsum with four brown vittae, the lateral ones abbreviated in front; scutellum the same color as the dorsum, but the edges a little yellowish; pleurae black with white pollen. Abdomen black, covered with white pollen which is thickest on the posterior margins of the segments; fifth segment with a yellow hind margin; venter yellow; hairs on the tergum black, those on the sides of the last three segments white; hypopygium shining black, polished, and rather large; appendages shining black. Legs yellow; front and middle coxae with yellowish hairs and bristles; middle and hind coxae darkened on the outside; front tibiae longer than their tarsi or femora, which are of equal length; metatarsi longer than the remaining four joints together; fourth and fifth joints black, flattened, and fringed on each side, forming an oval tip, which is nearly twice as long as wide; middle metatarsi nearly three-fourths as long as their tibiae; hind tarsi nearly as long as their tibiae, the second joint a little longer than the first; hind femora with a few yellow bristles below near the base. Halteres yellow; tegulae and their long cilia whitish. Wings hyaline; fourth vein rather sharply bent towards the third, ending in the apex of the wing, not very close to the tip of the third vein; veins brown.

Described from two males in the collection of the American Entomological Society, which were taken at Alamogordo, N. M., on April 20 and May 12, 1902. Type No. 5257.

30 *Neurigona australis* n. sp.

Figure 31.

Dorsum of the thorax grayish green; abdomen with the dorsum entirely blackish; hypopygium shining black, large; front tarsi with the last two joints flattened and fringed with black hairs, forming an oval tip to the tarsi; front tibiæ shorter than their tarsi. Length of male and female  $4\frac{1}{2}$  mm.

Male: Face narrow, silvery white; palpi and proboscis yellow; front and occiput black, with grayish white pollen, the latter with purple reflections; orbital cilia white except a few of the uppermost which are black; antennæ yellow, third joint and arista brownish. Dorsum of the thorax grayish green, with some purple reflections, and grayish pollenose, with four brown vittæ, the lateral ones rather poorly defined; pleuræ and metanotum black, and covered with white pollen; a small yellowish spot below the humeri; scutellum the same color as the dorsum. Abdomen metallic black and covered with grayish pollen, which is thickest on the sides; fifth segment glabrous and shining; venter sordid yellow; hairs of the abdomen mostly pale, rather scattering, but longer and more abundant on the sides and posterior end; hypopygium shining black, large, polished, rounded behind, and with black appendages. Legs yellow; middle and hind coxæ blackened almost to the tip; front and middle coxæ with white hairs and bristles; front tibiæ and tarsi darker than their femora the tibiæ a little longer than their femora, and the tarsi nearly one and one-third times as long as the tibiæ, the last four joints flattened, fourth and fifth joints black and fringed on each side, forming an oval tip to the tarsi; front metatarsi nearly as long as the remaining four joints together; middle metatarsi about the same length as their tibiæ; a few weak yellow bristles on the lower side of the middle femora near the base; hind tarsi about the same length as their tibiæ, and the first joint longer than the second; last four joints of the middle and hind tarsi darkened. Halteres, tegulæ, and their cilia yellowish. Wings hyaline, only slightly tinged with grayish; anal angle not prominent; fourth vein sharply bent towards the third, ending in the apex of the wing, not very near the tip of the third vein.

Female: Differs from the male as follows: the abdomen is lighter colored, more like the dorsum of the thorax; the front tarsi are plane; the middle femora without bristles below; and the first and second joints of the hind tarsi nearly equal.

Described from one male, and five females from New Mexico. The male and one female are in the collection of the American Entomological Society, and were taken at Cloudcroft, N. M., June 18, 1902; in the National Museum collection are three females, taken at Las Vegas, N. M., Aug. 7, 8, and 11, by S. H. Baker; and one female taken on the White Mountains, N. M., Aug. 5th, by Townsend, at 6500 feet altitude. Type in the collection of the American Entomological Society; type No. 5256.

31 *Neurigona albospinosa* n. sp.

Figure 32.

Thorax blackish, with three metallic brown vittæ; abdomen greenish black, segments gray pollenose at base; hypopygium small, testaceous; hind coxæ with several rather weak whitish bristles. Length of male 4-4½ mm., female 3½-5 mm.

Male: Face not very narrow for a male, and with the sides nearly parallel; face and palpi white; proboscis and antennæ yellow, the latter with the third joint and the arista dark brown; front and occiput dark grayish green with white pollen; orbital cilia white. Thorax and scutellum blackish, more gray on the dorsum, and with three somewhat shining metallic brown vittæ, the central one between the acrostichal bristles most sharply defined; thorax including scutellum and metanotum whitish pollenose, the pollen more brown on the flattened space before the scutellum, this brown pollen extends somewhat onto the scutellum. Abdomen metallic greenish black with coppery reflections, and a grayish pollenose band at the base of each segment; the hairs on these bands white, on the posterior part of the segments the hairs are black; the first segment wholly gray pollenose, and with the marginal row of bristles pale except about four at the top which are black; second segment with two transverse rows of black dashes near the base; venter of the first segment, and very narrow lateral edges of one or more of the others yellow; hypopygium testaceous, polished, and rather small. Legs pale yellow; front coxæ whitish with long white hairs on the whole front; middle coxæ also with white hairs and bristles; hind coxæ with one long and several weak whitish bristles on the outside; middle and hind coxæ blackish at base; front and middle metatarsi about two-thirds as long as their tibiæ; hind tarsi with the first joint shorter than the second; middle and hind tarsi infuscated from the tip of the first joint; hind femora brownish above. Cilia of the tegulæ whitish; halteres yellow with the knob whitish. Wings brownish hyaline, darker along the front; third and fourth veins wide apart at tip.

Females: Agrees with the male in most characters, but the scutellum yellow, sometimes a little darkened at base; marginal row of bristles on the first segment of abdomen black, sometimes one or two of the lower ones yellowish; stout bristles on hind coxæ brown in some lights. Face broad, darker than in the male, and the palpi yellowish.

Described from seven males and twelve females, from Idaho, Wash., and Cal. I received from Prof. Aldrich specimens taken at Lewiston, and Juliaetta, Idaho, the latter taken May 7th; also specimens taken at Stanford University, Cal., Feb. 22 to March 24th. From Prof. Melander I received specimens from Wenatchee, Wash., taken May 8th.

32 *Neurigona minuta* n. sp.

Dark metallic green; arista white; hind coxæ with a yellow bristle on the outside. Length 2 mm.

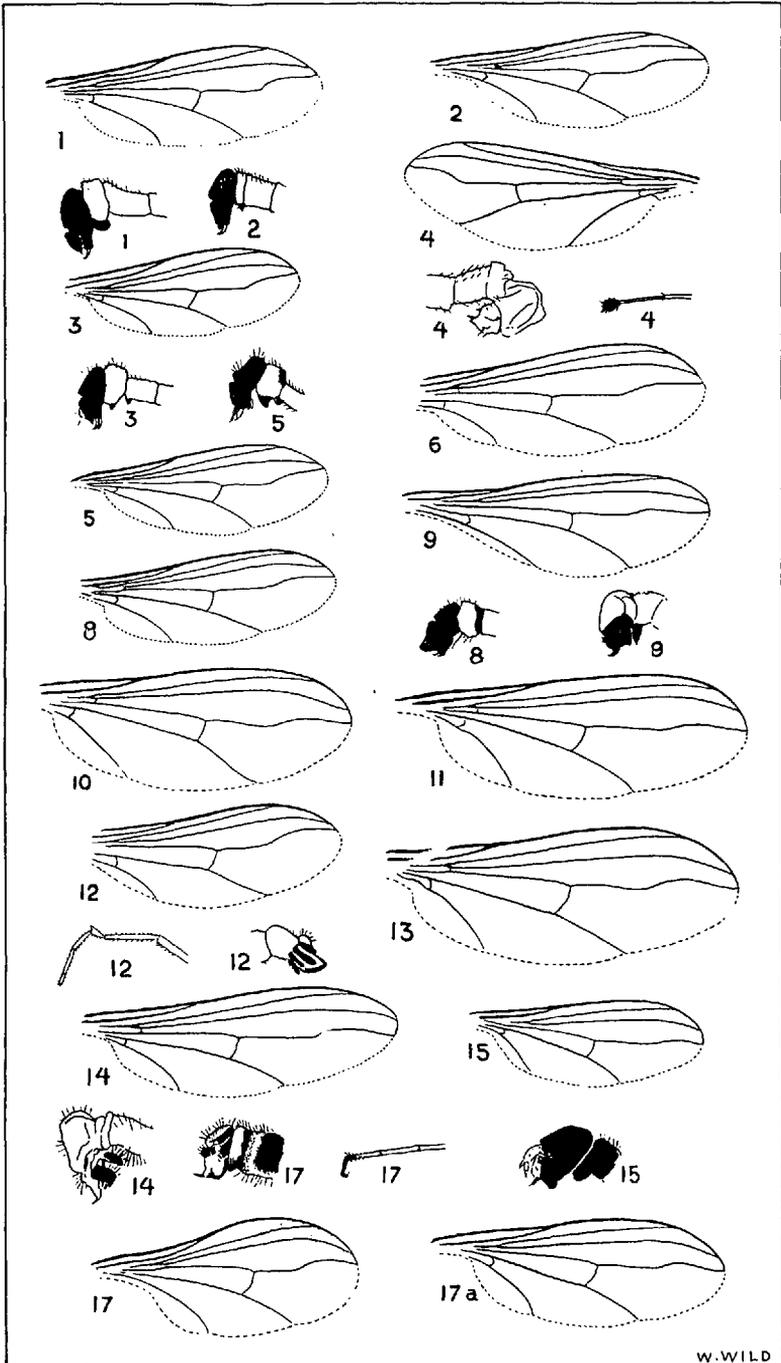
Female: Face, front and occiput greenish black, with but little pollen (at least in the type specimen); palpi and proboscis yellow, the former with minute black hairs on the surface and a black bristle at tip; antennæ dark reddish brown, the third joint rounded, hardly pointed, and more brown than the basal joints, the arista inserted near the apex, white. Thorax rather dark metallic green, covered with gray pollen; humeri with only a trace of yellowish; the flattened space before the scutellum not very sharply defined; bristles of the thorax strong, acrostichal bristles well developed, in two rows; the outer pair of scutellar bristles minute but distinct. Abdomen dark metallic green, with black hairs; venter dark. Legs and coxæ pale yellow; front coxæ with whitish hairs and bristles; middle coxæ with brownish hairs; the large bristle on the outer surface of the hind coxæ yellow; the hairs on all the legs very minute; front and middle tarsi about one and one-half times as long as their tibiæ, their first joint being about half as long as the tibiæ; middle tibiæ with two black bristles near the base, one on the front side, and one on the outer side; hind tibiæ with a row of four or five black bristles on the posterior surface; hind tarsi a little longer than their tibiæ, and with the first joint only half as long as the second. Halteres, tegulæ and their cilia pale yellow. Wings hyaline, only slightly tinged with grayish; venation about as in *N. aldrichii* (Fig. 12), except that the posterior cross-vein is only its own length from the wing margin measured on the fifth vein, and the apical half of the last section of the fourth vein is nearly straight; veins brown, becoming pale yellow at the root of the wing.

Described from one female from Philadelphia, Pa., which was bred from decaying oak, May 23, 1907. Type in the collection of Prof. J. M. Aldrich.

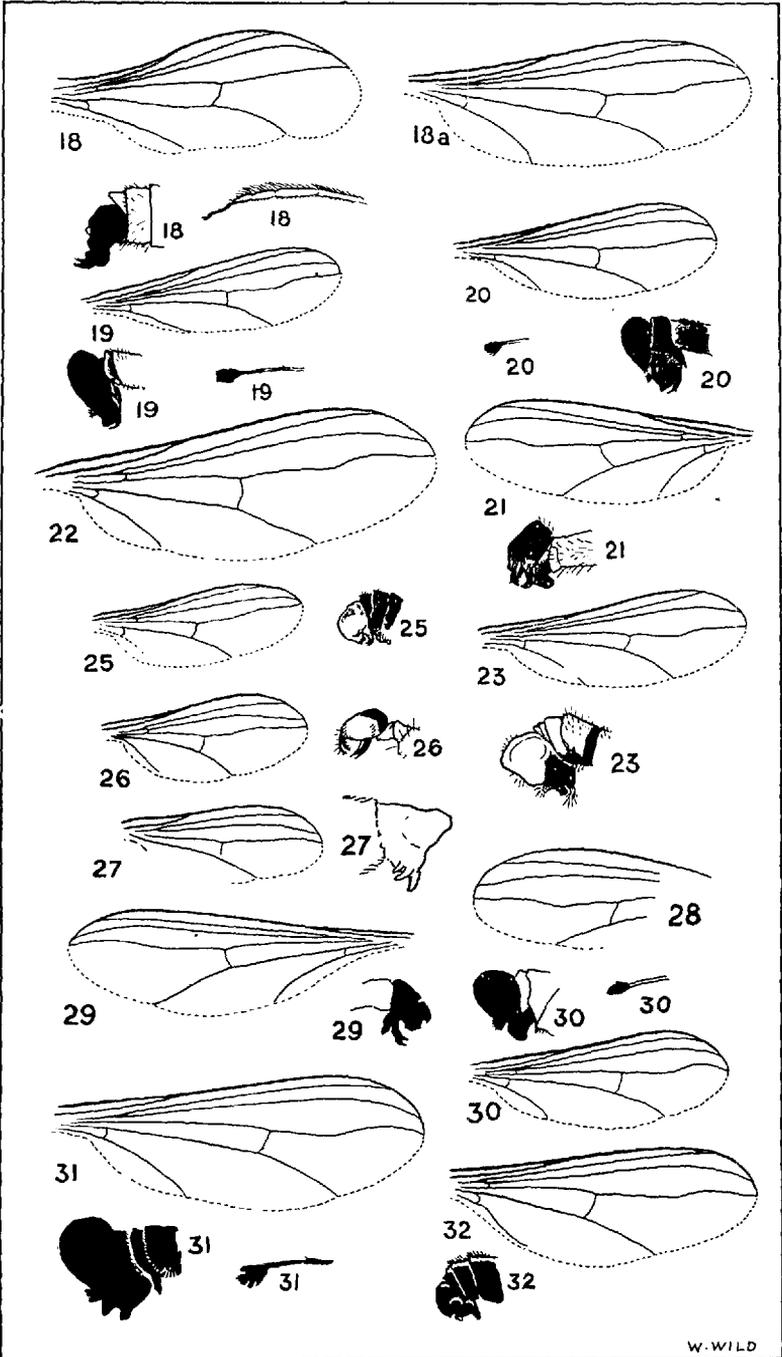
Note.—This is the smallest species of the genus that I have seen, and is very distinct from all the others. It can readily be distinguished by the pale bristles of the coxæ, and its white arista.

## EXPLANATION OF PLATES.

- Fig. 1. *Neurigona rubella* Loew, wing and hypopygium of male.  
 " 2. " *perplexa* n. sp. wing and hypopygium of male.  
 " 3. " *dimidiata* Loew, wing and hypopygium of male.  
 " 4. " *carbonifer* Loew, wing, hypopygium, and tip of front tarsi of male.  
 " 5. " *nitida* n. sp. wing and hypopygium of male.  
 " 6. " *tridens* n. sp. wing of female.  
 " 8. " *maculata* n. sp. wing and hypopygium of male.  
 " 9. " *floridula* Wheeler, wing and hypopygium of male.  
 " 10. " *floridula* var. *infuscata* n. var. wing of female.  
 " 11. " *flava* n. sp. wing of female.  
 " 12. " *aldrichii* n. sp. wing, hypopygium, and front tarsi of male.  
 " 13. " *transversa* n. sp. wing of female.  
 " 14. " *disjuncta* n. sp. wing and hypopygium of male.  
 " 15. " *viridis* n. sp. wing and hypopygium of male.  
 " 17. " *arcuata* n. sp. wing, hypopygium, and tip of front tarsi of male.  
 " 17a. " *arcuata* n. sp. wing of female.  
 " 18. " *deformis* n. sp. wing, hypopygium, and tip of front tarsi of male.  
 " 18a. " *deformis* n. sp. wing of female.  
 " 19. " *tenuis* Loew, wing, hypopygium, and tip of front tarsi of male.  
 " 20. " *pectoralis* n. sp. wing, hypopygium, and tip of front tarsi of male.  
 " 21. " *æstiva* n. sp. wing and hypopygium of male.  
 " 22. " *bivittata* n. sp. wing of female.  
 " 23. " *tarsalis* n. sp. wing and hypopygium of male.  
 " 25. " *lateralis* Say, wing and hypopygium of male.  
 " 26. " *setosa* n. sp. wing and hypopygium of male, the latter is stretched out backwards.  
 " 27. " *tibialis* n. sp. wing and hypopygium of male.  
 " 28. " *quadrifasciata* Fab. (European) apical part of wing.  
 " 29. " *ciliata* n. sp. wing and hypopygium of male.  
 " 30. " *perbrevis* n. sp. wing, hypopygium, and tip of front tarsi of male.  
 " 31. " *australis* n. sp. wing, hypopygium, and tip of front tarsi of male.  
 " 32. " *albospinosa* n. sp. wing, and hypopygium of male.



M. C. Van Duzee.



W. WILD

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