

A REVISION OF *CYRTONEURINA*  
GIGLIO-TOS, WITH NOTES  
ON RELATED GENERA  
(DIPTERA, MUSCIDAE)

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OF THE  
AMERICAN MUSEUM OF NATURAL HISTORY  
VOLUME 103 : ARTICLE 6      NEW YORK : 1954





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Volume 103, article 6, pages 417–464, figures 1–63, table 1

*Issued April 26, 1954*

*Price: \$.75 a copy*



## INTRODUCTION

THE MUSCID GENUS *Cyrtoneurina* Giglio-Tos is one of the more abundant phaoniine groups in the neotropics. It may be of some hygienic importance because of the semi-domestic habits of the adults of several species and the environment in which the coprophagous larvae develop.

This paper is primarily intended to elucidate the species of *Cyrtoneurina*. However, study of type and other material revealed certain synonymy in closely related genera. Consequently notes on these genera are included, with a key to distinguish *Cyrtoneurina* from them.

In general, the Phaoniinae in this region can be divided into four groups, of which *Phaonia* Robineau-Desvoidy, *Limnophora* Robineau-Desvoidy, *Mydaea* Robineau-Desvoidy (or *Helina* Robineau-Desvoidy), and *Cyrtoneurina* Giglio-Tos are not only typical but also the most abundant in regard to species and individuals.

The last group, called Cyrtoneurini for convenience, is readily distinguished from the other groups by the possession of setulae or long hairs on the pteropleura and the lack of a well-developed posterodorsal calcar on the apical two-fifths or less of the hind tibiae. Specimens with pteropleural setulae and having the hind tibiae with a submedian posterodorsal bristle, which is scarcely longer than the tibial diameter, belong to the Cyrtoneurini; and the short posterodorsal bristle is not homologous to the calcar in *Phaonia* and allies in my opinion. Cyrtoneurini are therefore similar to the Ethiopian Dichaetomyiini, defined by van Emden (1951), but are in better agreement with his earlier (1942) definition of the *Dichaetomyia*-group.

Certain questions arise concerning type material of two early authors. In 1893 Giglio-Tos published a short Latin diagnosis of some new species, but did not mention localities or specimens. In 1894, as part of a large paper on the Diptera of Mexico in Bellardi's collection, he published more detailed descriptions of these species and included the number and sexes of specimens studied and the localities where they were found. There is no evidence to indicate that these latter specimens are not the ones which

he had when describing the species in 1893. However, type material as such is not mentioned in either paper, and none of the Giglio-Tos "Ditteri del Messico" muscid material at present in the collection of the University of Turin bears type labels. Giglio-Tos' own handwritten labels are attached to the first specimen of each species in this collection, and the number of specimens tallies with those in his 1894 paper. They also agree with his rather generalized descriptions. Consequently, I have considered them to be cotypes and in some cases certain individual specimens have been designated as lectotypes. In these instances, a label bearing the species name, with the note "type by subsequent designation F. S. '52," has been added to the lectotype.

The van der Wulp "Biologia Centrali Americana" material in the British Museum (Natural History) bears cotype labels, and in a few instances lectotypes have been selected from this material. Specimens of some of van der Wulp's species of *Clinopera* were not present in the British Museum (Natural History), but were later found in the de Meijere collection at the University of Amsterdam. None of these bear cotype labels, but are considered to be cotypes because the locality labels are similar in form to those in the British Museum (Natural History) and the specimens agree with van der Wulp's statements and frequently the number of specimens tallies with his published notes.

New species described in the present paper are deposited in the American Museum of Natural History unless otherwise noted.

In the following descriptions the term "pre-episternum III" is used for the sclerite posterior, and somewhat ventrad, to the hypopleura; in previous papers, this sclerite has been referred to as the "subtriangular portion of the hypopleura above hind coxae."

The name "supraspiracular callosity" is used for the slightly swollen portion of the thoracic pleura above (dorsad to) the posterior thoracic spiracle.

The region called the "pleuratergite below lower calyptrae" is best seen when the specimen is viewed posterolaterally. This area is limited anterodorsally by the root or inser-

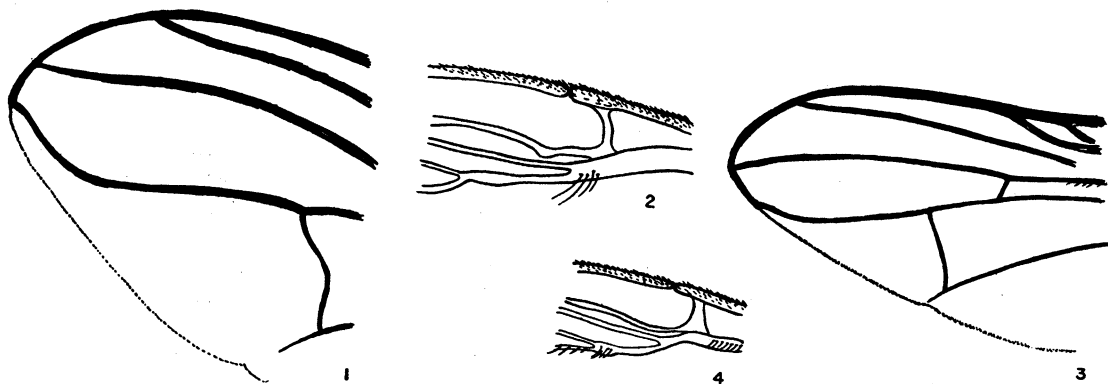
tion of the lower calyptra and antero-ventrally by the supraspiracular callosity; a line projected from the root of the halter to the posterodorsal point of attachment of the lower calyptra bounds it posterodorsally. This area can be bare, pilose, or setulose. When setulae are present, they are homologous to the "infrasquamal setulae" defined by Curran (1934b, p. 486).

Because this paper is primarily taxonomic and most specimen labels offer very few, if any, clues to micro-habits, I have deliberately refrained from noting the exact locality, date, and collector of nearly one thousand specimens of certain abundant and widely distributed species, but the countries in which they were collected are reported. Certain other species are frequently as abundant in certain localities but are generally less widely distributed; and with these species, the town, village, or state in which they were collected, when known, is given after the country. In the case of lesser known or controversial species, all data on the specimen are given following the name of the country in which it was collected. Locality and other data of type material of new species are given in the order in which they appear on the specimen labels, but abbreviations on them have been written out in keeping with editorial policy.

To Mr. H. Oldroyd, Keeper of Diptera in the British Museum (Natural History), and Dr. F. I. van Emden, British Commonwealth

Institute of Entomology, I owe thanks for courtesy and help in the study of types and other material in the British Museum (Natural History). Prof. Dr. Athos Goidanich, Director of the Instituto di Entomologia Agraria, University of Turin, graciously provided laboratory space for study of the Giglio-Tos material and arranged for its loan from Prof. Dr. Arcangeli, Director of the Instituto di Zoologia of the University of Turin. To Dr. C. W. Sabrosky and the authorities of the United States National Museum I am grateful for the loan of many specimens for study. Dr. C. A. W. Jeekel of the Zoological Museum, University of Amsterdam, located certain van der Wulp material in the de Meijere collection for which I am most grateful. Dr. C. H. Curran again generously lent types of his species and other material from the collection of the American Museum of Natural History. To Dr. Willi Hennig of the Deutsches Entomologisches Institut I am most grateful for valuable notes on several of Stein's types in the collection of the Zoological Museum of the University of Berlin.

Grateful acknowledgement is also made of the helpful advice freely given by Prof. J. E. Bequaert, Mr. J. E. Collin, Dr. C. H. Curran, Dr. F. I. van Emden, Dr. H. C. Hockett, Dr. M. T. James, Mr. C. F. W. Muesebeck, Mr. H. Oldroyd, and Dr. C. W. Sabrosky regarding the nomenclatural problems involved in the genotype of *Cyrtoneuropsis* Malloch.



FIGS. 1, 2. *Neomuscina tripunctata* (van der Wulp). 1. Apex of wing. 2. Base of wing, ventral view. FIGS. 3, 4. *Cyrtoneurina uber* Giglio-Tos. 3. Apex of wing. 4. Base of wing, ventral view.



## DESCRIPTION OF SPECIES

### KEY TO THE GENERA OF CYRTONEURINI

1. Suprasquamal ridge setulose . . . . . *Mulfordia* Malloch  
Suprasquamal ridge bare . . . . . 2
2. Fourth vein with a distinct forward apical curvature (figs. 1 and 3) . . . . . 4  
Fourth vein without even a slight forward curvature . . . . . 3
3. First vein setulose beyond the humeral cross vein; hypopleura entirely bare; hind tibiae with a median posterodorsal bristle; scutellum not setulose below level of marginals . . . . . *Steinella* Malloch  
First vein entirely bare; hypopleura setulose below spiracle; hind tibiae without a median posterodorsal bristle; scutellum setulose below level of marginals . . . . . *Xenothoracochaeta* Malloch
4. Disc of lower calyptrae with long dorsal hairs . . . . . *Pseudophilepis* Snyder  
Disc of lower calyptrae without long dorsal hairs . . . . . 5
5. Fifth vein setulose; wing membrane with very conspicuous clothing setulae which are considerably longer than usual . . . . . *Chaetogenia* Malloch  
Fifth vein not setulose; wing membrane with clothing setulae normal, inconspicuous . . 6
6. All veins except costa bare . . . . . *Hemichlora* van der Wulp  
Some portion of stem, first, or third veins setulose . . . . . 7
7. Apical portion of stem vein (fig. 2) always setulose on ventral surface and usually with one or two setulae on dorsal surface; the basal section of stem vein always bare on both surfaces; prosternum bare; fourth vein strongly curved forward and terminating at or close to wing tip; third vein terminating well before wing tip (fig. 1) . . . . . *Neomuscina* Townsend  
Apical portion of stem vein (fig. 4) always bare on dorsal and ventral surface; basal portion setulose or bare; prosternum setulose or bare; fourth vein terminating well behind wing tip and the third vein terminating at or near wing tip (fig. 3) except in *continens*, new species . . . *Cyrtoneurina* Giglio-Tos

### XENOTHORACOAETA MALLOCH

*Xenothoracochaeta* MALLOCH, 1921, Ann. Mag. Nat. Hist., ser. 9, vol. 7, p. 170.

*Airalips* SNYDER, 1949, Amer. Mus. Novitates, no. 1402, p. 9.

The type specimen of *Xenothoracochaeta*

*prima* Malloch was studied and found to have a few setulae on the ventral surface of the third vein beyond the node. Malloch's statement of "wing veins bare" (*loc. cit.*) should be modified accordingly. *Airalips differentia* Snyder<sup>1</sup> (1949a, p. 10) is a synonym of the genotype of *Xenothoracochaeta* Malloch.

If the presence of a single pair of presutural dorsocentral bristles is considered to be a generic or subgeneric character in this group, *Airalips* could be maintained as distinct from *Xenothoracochaeta*, because the genotype of *Airalips* (*Spilogaster plumata* Stein, 1904, p. 446) has two presutural pairs as do *caerulea* Snyder and *fuscomarginata* Snyder. However, the anterior presutural pair are considerably shorter than usual in the latter species and may indicate a tendency for evolutionary loss of these bristles. *Airalips* is therefore considered to be a synonym of *Xenothoracochaeta*.

### HEMICHLORA VAN DER WULP

*Hemichlora* VAN DER WULP, 1896, Biologia Centrali-Americana, vol. 2, p. 303.

This genus is similar to *Neomuscina* Townsend, *sensu stricto*, but differs in lacking hairs on all wing veins except costa. The propleura and prosternum are bare, and there are hypopleural hairs below the spiracle. The arista has some short rays on the dorsal surface only, and the lower posterior one or two sternopleural bristles are very short. The female front is broad at vertex and is much narrowed anteriorly. Sometimes the hind tibiae have one of the posterodorsal clothing setulae, in the same position as the calcar in *Phaonia* and relatives, slightly more well developed than the other clothing setulae, but since this setula is sometimes absent on one or both legs and is never much longer than the tibial diameter, I am including *Hemichlora* in the Cyrtoneurini instead of the Phaoniini.

A single species, *Cyrtoneura vittigera* Bigot, was included when van der Wulp described *Hemichlora*; it is automatically the genotype. His specimens of this species (one female,

<sup>1</sup> A *lapsus* occurs in the description of the dorsocentral arrangement of *Airalips differentia* Snyder (1949a, p. 10). The dorsocentrals are 1:3 as correctly noted in the key, not 2:3 as erroneously stated in the description.

Amula, Guerrero, 6000 feet, August, H. H. Smith, and two females, San Geronimo, Guatemala, Champion) have been studied in the British Museum (Natural History). They are conspecific with the species identified as *vittigera* Bigot by Giglio-Tos in the University of Turin collection, and all are conspecific with the type of *Pyrellia scordalus* Walker (1861, p. 313) which I have studied in the British Museum (Natural History).

#### NEOMUSCINA TOWNSEND

*Neomuscina* TOWNSEND, 1919, Proc. U. S. Natl. Mus., vol. 56, p. 541.

A study of the Giglio-Tos and van der Wulp type material revealed several species belonging to *Neomuscina* which were not included in a revision of the genus published several years ago (Snyder, 1949b).<sup>1</sup> Notes on these species and certain others are presented together with a revised key to the genus.

#### KEY TO *Neomuscina* TOWNSEND, SENSU LATO

1. Third wing vein entirely bare . . . . .  
     . . . . . *Neomuscina*, sensu stricto, 2  
     Third wing vein with one or more hairs on  
     ventral surface beyond the node . . . . .  
     . . . Subgenus *Spilopteromyia* Malloch, 28
2. With one or more pairs of distinct presutural  
     acrostical bristles . . . . . 3  
     Without distinct presutural acrostical bristles  
     . . . . . 13
3. Hypopleura with hairs or setulae below (ven-  
     trad to) the spiracle . . . . .  
     . . . . . *tripunctata* (van der Wulp)  
     Hypopleura bare below spiracle . . . . . 4
4. Mid femora with two strong pre-apical, dorsal  
     to posterior bristles . . . . .  
     . . . . . *zosteris* (Shannon and del Ponte)  
     Mid femora with three strong pre-apical dorsal  
     to posterior bristles . . . . . 5
5. Hind tibiae with two median anterodorsal  
     bristles . . . . . 6  
     Hind tibiae with one median anterodorsal

<sup>1</sup> In discussing the habits of *Neomuscina* (Snyder, 1949b, p. 1) and in recording labels on specimens (*ibid.*, pp. 18, 28), I erroneously used the generic name "*Formes*." The pin transfixing what I believed to be the "*r*" in *Formes*. The word on the very small label is actually "*Fomes*." The association of *Neomuscina* with the fungus genus *Fomes* is more in keeping with their saprophagous or coprophagous habits, and there is thus no valid reason to associate them with the ant genus *Formes*.

A *lapsus* is my use of the word "below" for "above" in describing the coxal hairs in the generic description of *Neomuscina* (Snyder, 1949b, p. 3, line 3).

- bristle . . . . . 8
6. Mid and hind femora fulvous, with the possible exception of extreme base . . . . . 7  
     Mid and hind femora fulvous on the basal one-half or more . . . . . *nudistigma* Snyder
7. *Male*: Margins of upper calyptrae broadly infuscated; eye facets not conspicuously enlarged above and in front; diameter of anterior ocellus subequal to diameter of one of the posterior ocelli. *Female*: Palpi conspicuously enlarged near apex, this apical portion 1.7 times the basal diameter . . . . .  
     . . . . . *vecta* (Giglio-Tos)  
     *Male*: Margins of upper calyptrae not broadly infuscated, at most narrowly bordered with brown; eye facets conspicuously enlarged above and in front; diameter of anterior ocellus approximately two times that of one of the posterior ocelli. ?*Female*: Palpi not conspicuously enlarged apically . . . . .  
     . . . . . *paralis* (Giglio-Tos)
8. Base of femora infuscated, usually one or more pairs of coxae with dark streaks . . . . . 9  
     Base of femora and all coxae entirely yellow to fulvous . . . . . 11
9. Cross veins surrounded by extensive, infuscated clouds . . . . . 23  
     Cross veins not surrounded by dark clouds. 10
10. *Male*: Intra-alars 2; eye facets not conspicuously enlarged above and in front . . . . .  
     . . . . . *davida* Snyder  
     *Male*: Intra-alar 1; eyes with an area of conspicuously enlarged facets above and in front . . . . . *macrops* Snyder
11. Without dark accessory setulae adjacent to either the prothoracic or stigmal bristle . . . . .  
     . . . . . *sanespera* Snyder  
     With dark accessory setulae adjacent to both the prothoracic and the stigmal bristle . . . . . 12
12. Dorsocentrals 2:3 . . . . . *triseta* Snyder  
     Dorsocentrals 2:4 . . . . . *praetaseta*, new species
13. Dorsocentrals 2:3 . . . . . 14  
     Dorsocentrals 2:4 . . . . . 16
14. Mid femora with three pre-apical bristles, a dorsal, posterodorsal, and posterior one . 15  
     Mid femora with two pre-apical bristles, the dorsal one absent . . . . . *capalia* Snyder
15. Calyptrae deep brown, the margins infuscated; hind femora with a complete row of anteroventral bristles; third wing vein bare ventrally . . . . . *inflexa* (Stein)  
     Calyptrae white to pale yellow, the margins not infuscated; hind femora with only two to three long anteroventral bristles which are pre-apically situated; third wing vein with a single ventral setula beyond node . . . . . *currani* Snyder



16. Mid femora with two pre-apical bristles . . .17  
Mid femora with three pre-apical bristles . . .23
17. Hind tibiae with two submedian anterodorsal bristles; thoracic pleura mostly infuscated . . .21  
Hind tibiae with one submedian anterodorsal bristle; thoracic pleura mostly fulvous . . .18
18. Mid and hind femora infuscated on at least the basal one-half . . .*mediana* Snyder  
Mid and hind femora entirely fulvous to light brown . . .19
19. Calyptrae and their margins darkened . . .*zosteris* (Shannon and del Ponte)  
Calyptrae and their margins not darkened .20
20. Wings with an uninterrupted dark cloud from apex of subcostal cloud to apex of second vein; fore tibiae with a short submedian anterodorsal bristle . . .*nigricosta* Snyder  
Wings with a distinct dark spot at apex of subcosta and a faint spot near apex of second vein, the interspace not darkened; fore tibiae without a submedian anterodorsal bristle . . .*transporta* Snyder
21. Wings with a faint to distinct dark cloud along costal margin and surrounding anterior and posterior cross veins; hind femora with a complete row of strong posteroventral bristles . . .22  
Wings without a trace of a dark cloud along costal margin or surrounding cross veins; hind femora with two to four posteroventral bristles on basal one-half only . . .*atincta* Snyder
22. Thorax and femora entirely fulvous . . .*transporta* Snyder  
Thorax and at least the mid and hind femora mostly infuscated . . .*nudistigma* Snyder
23. Posterior thoracic spiracle with several black setulae in at least the posteroventral corner in addition to the flap-like covering of hairs . . .*nudinervis* (Stein), *sensu lato*, 24  
Posterior thoracic spiracle without any black setulae in addition to the flap-like covering of hairs . . .25
24. Thoracic pleura and femora mostly infuscated . . .*nudinervis nudinervis* (Stein)  
Thoracic pleura and femora fulvous . . .*nudinervis pictipennis* (Bigot)
25. Wings with infuscated areas . . .27  
Wings without infuscated areas . . .26
26. The basal three-fourths or more of at least the posterior femora infuscated. *Male*: Intralar 1 . . .*instabilis* Snyder  
All femora entirely fulvous. *Male*: Intralar 2 . . .*schadei* Snyder
27. Posterior four femora infuscated . . .*similata* Snyder<sup>1</sup>

- Posterior four femora mostly fulvous . . .*neosimilis* Snyder
28. Dorsocentrals 2:3 . . .*currani* Snyder  
Dorsocentrals 2:4 . . .29
29. Costal margin darkened . . .30  
Costal margin not darkened . . .*atincticosta* Snyder
30. Margins of calyptrae infuscated . . .*transversalis* (Stein)  
Margins of calyptrae not infuscated . . .*apicata* (Stein)

#### *Neomuscina tripunctata* (van der Wulp)

? *Cyrtoneura mexicana* MACQUART, 1843, *Diptères exotiques nouveaux ou peu connus*, vol. 2, pt. 3, p. 158.

*Cyrtoneurina mexicana* Macquart, GIGLIO-TOS, 1894, *Mem. R. Acad. Sci. Torino*, ser. 2, vol. 14, p. 13.

*Cyrtoneurina paralis* GIGLIO-TOS, 1893, *Boll. Mus. Zool. Anat. Univ. Torino*, vol. 18, no. 147, p. 6; 1894, *Mem. R. Accad. Sci. Torino*, ser. 2, vol. 14, p. 14 (in part: female).

*Muscina tripunctata* VAN DER WULP, 1896, *Biologia Centrali-Americana*, vol. 2, p. 305 (lectotype).

The cotype series of *Muscina tripunctata* van der Wulp in the British Museum (Natural History) contains four species as follows:

Three males, one female from northern Yucatan (Gaumer) are identical with *Neomuscina davida* Snyder (1949b, p. 14).

One female, Cuernavaca, Morelos, June (H. H. Smith), is the same as *Neomuscina trisetata* Snyder (1949b, p. 10).

One female, Amula, Guerrero, 6000 feet, August (H. H. Smith), is hereby designated as lectotype of *Muscina tripunctata* van der Wulp. It possesses hypopleural hairs below the spiracle and is identical with cotypes of *Muscina texana* Hough (1900, p. 25) and *Neomuscina cavicola* Townsend (1919, p. 541) in the British Museum (Natural History) and several other collections. It agrees with my redescription of this species.

Two females, Xucumanatlan, Guerrero, 7000 feet, two females, Amula, Guerrero, August, 6000 feet; and one female, Omilteme, Guerrero, July, 8000 feet (all H. H. Smith), have broad palpi and are conspecific with the female which is subsequently designated as the lectotype of *Muscina linea* van der Wulp. See also notes following *Neomuscina paralis* (Giglio-Tos).

<sup>1</sup> See notes on *nudinervis nudinervis* (Stein), page 428.

There are four males from Oaxaca identified as *Cyrtoneurina mexicana* (Macquart) by Giglio-Tos in the University of Turin collection. These have hypopleural hairs below the spiracle. The frontal vitta at its narrowest part is one to two times as wide as the diameter of the anterior ocellus and the front at the same level is as wide as the distance across the posterior ocelli inclusive. The leg bristling is the same as given for *tripunctata* van der Wulp (Snyder, 1949b, p. 7). These specimens are conspecific with the lectotype of *tripunctata*. If Giglio-Tos (1842, p. 158) has correctly identified *mexicana* Macquart, then that name should be used for the genotype of *Neomuscina*, since *Neomuscina cavicola* Townsend (1919) equals *Muscina texana* Hough (1900), which is the same as *Muscina tripunctata* van der Wulp (1896), the lectotype.

The cotype series of "*Muscina linea* van der Wulp" contains six species, as follows:

One female, Xucumanatlan, Guerrero, 7000 feet, July, and one female, Amula, Guerrero, 6000 feet, August (both H. H. Smith), have broad palpi. Since van der Wulp noted this particular character, I have designated the above female from Xucumanatlan as the lectotype of *Muscina linea* van der Wulp. This specimen is conspecific with *Cyrtoneurina vecta* Giglio-Tos, and the name *linea* is a synonym of it.

Two males, Tierra Colorado, Guerrero, 2000 feet, October (H. H. Smith), are darker than any others in the remainder of the cotype series and are doubtless the ones which van der Wulp mentioned as being somewhat atypical. These are conspecific with my concept (1949b, p. 27) of *Neomuscina nudinervis nudinervis* (Stein).

Two females, Amula, Guerrero, 6000 feet, August (H. H. Smith), are conspecific with the male, having four postsutural dorso-central bristles discussed under *triseta* Snyder (1949b, p. 10). See also the notes under *Neomuscina praetaseta*, new species, below.

One male, Xucumanatlan, Guerrero, 7000 feet (H. H. Smith), is conspecific with *triseta*, but the weak second anterodorsal bristle is absent on the hind tibiae.

One female, Amula, Guerrero, 6000 feet (H. H. Smith), lacks presutural acrostical bristles and does not satisfactorily trace to any species in my key. It is probably un-

described but is not named because of lack of additional material.

One male, Xucumanatlan, Guerrero, 7000 feet, and one male, Amula, Guerrero, 6000 feet, August (both H. H. Smith), are closely related to the lectotype and are conspecific with male cotypes of *Cyrtoneurina vecta* Giglio-Tos. See also notes under that species.

#### *Neomuscina paralis* (Giglio-Tos)

*Cyrtoneurina paralis* GIGLIO-TOS, 1893, Boll. Mus. Zool. Anat. Univ. Torino, vol. 8, no. 147, p. 6; 1894, Mem. R. Accad. Sci. Torino, ser. 2, vol. 14, p. 14 (lectotype and males).

The cotype series of *paralis* Giglio-Tos contains seven males and six females from Oaxaca (Sumichrast). The female specimens have hypopleural hairs below the spiracle and are conspecific with the four males from the same locality determined as *mexicana* Macquart by Giglio-Tos and with the lectotype of *Muscina tripunctata* van der Wulp.

Male specimens under the name *paralis* Giglio-Tos in the University of Turin collection, one of which is hereby designated as the lectotype, are not conspecific with the females associated with them by Giglio-Tos, but are conspecific with two males in the cotype series of *Muscina linea* van der Wulp which is discussed in the last paragraph under that name. The following description applies to the lectotype.

MALE: Upper three-fourths of back of head infuscated, remainder fulvous; entirely grayish pruinose. Parafrontals broadly contiguous from opposite anterior ocellus to middle of front. The frontal vitta is reddish anteriorly. Front at narrowest part not so wide as diameter of anterior ocellus, the latter somewhat larger than usual in the genus. The anterior two pairs of parafrontal bristles strong, the remaining ones setulose and short, but extending to opposite anterior ocellus. Juncture of parafacials and parafrontals in profile not protruding more than a distance equal to diameter of arista at base. Cheeks as high as width of third antennal segment. Antennae inserted opposite middle of eyes and extending to oral margin. Third segment 2.5 times as long as second. Longest arisal hairs 0.5 of the length of third antennal segment. Antennae fulvous orange. Palpi fulvous, not pre-apically expanded. Eye facets

noticeably enlarged above in front.

Thoracic dorsum fulvous brown, grayish pruinulent; indistinctly quadrivittate. Acrosticals 1:1, presutural pair longest. Dorso-centrals 2:4; intra-alars 2; pra absent; with setulae adjacent to base of anterior notopleural bristle. Hypopleura with a few hairs in front of spiracle and on pre-episternum III, but bare below spiracle. Posterior thoracic spiracle very large, larger than the supraspiracular convexity and without accessory setulae among the flap-like covering of hairs. Scutellar setulae extending to but not invading the ventral surface except at base of corners.

Legs entirely fulvous. Fore tibiae with two to four short anterodorsal setulae on the apical one-half. Mid femora with six to eight ventral bristles on basal one-half to two-thirds and with an apical dorsal, posterodorsal, and posterior bristle. Mid tibiae with three posterior bristles near middle. Hind femora with six to eight anteroventrals, those near base shortest; and with six posteroventrals on the basal one-half to two-thirds. Hind tibiae with two submedian anterodorsals and anteroventrals.

Wings unspotted but with a slight fulvous tinge. Calyptae concolorous with wing, the margins of the upper ones somewhat brownish.

Abdomen fulvous, with a dark median spot on the basal one-half of second to fourth visible tergites, inclusive.

***Neomuscina vecta* (Giglio-Tos)**

*Cyrtoneurina vecta* GIGLIO-TOS, 1893, Boll. Mus. Zool. Anat. Univ. Torino, vol. 8, no. 147, p. 6; 1894, Mem. R. Accad. Sci. Torino, ser. 2, vol. 14, p. 14.

*Muscina linea* VAN DER WULP, 1896, Biologia Centrali-Americana, vol. 2, p. 304 (lectotype).

*Muscina tripunctata* VAN DER WULP, 1896, *op. cit.*, p. 305 (in part).

There is a single male from Tuxpango (Sumichrast) under this name in the University of Turin collection. It is considered to be the holotype, because Giglio-Tos' description included but one male. It agrees in most characters with *paralis*, but differs as follows: Front at narrowest part not so wide as the diameter of the small anterior ocellus. The group of enlarged eye facets are not so con-

spicuous as in *paralis*. Palpi broadened preapically, but at their widest part they are not more than 0.7 times greater than their basal width. Margins of both calyptae distinctly darkened.

The female lectotype of *Muscina linea* van der Wulp is conspecific with the above-mentioned male. It has the front 0.3 of head width, almost parallel sided, and with a complete row of parafrontal bristles, laterad of which there are shorter setulae. In profile, the juncture of parafacials and parafrontals is 0.33 as long as width of the rather broad third antennal segment. Parafacials narrowed to one-half of this distance below. Palpi almost spatulate, at their widest part as broad as, or slightly broader than, the width of third antennal segment.

Thorax more noticeably grayish pruinulent and with the subshiny brown vittae more distinct. There are also a median vitta and one on each side of the dorsocentral planes. Pra present, though very short. Hind femora with posteroventral bristles shorter and less numerous. Otherwise as in the male.

***Neomuscina zosteris* (Shannon and Del Ponte)**

*Muscina zosteris* SHANNON AND DEL PONTE, 1926, Rev. Inst. Bact., Buenos Aires, vol. 4, p. 579.

*Neomuscina fulvifrons* SNYDER, 1949, Amer. Mus. Novitates, no. 1404, p. 20.

Through the courtesy of Dr. M. L. Aczél, Instituto Miguel Lillo, Tucuman, Argentina, I have had the opportunity to study a series of four males and six females which are considered to be this species. They are labeled "V. Padre Monti (R. A.) Tucumán Guruyacu," January 17–February 7, 1948 (R. Goldbach). They indicate that the presutural acrostical bristles vary in strength. These bristles are clearly distinguishable in all males studied, though they are sometimes quite weak. In females, they are very weak or absent, or a single one may be present on only one side. This sex, therefore, traces to *fulvifrons* Snyder (1949b, p. 20) and I am unable to find satisfactory characters to separate them from paratypes of *fulvifrons*, especially since the above females exhibit considerable variation in head color. *Neomuscina fulvifrons* Snyder is therefore a synonym of *zosteris*.

***Neomuscina praetaseta*, new species**

*Muscina linea* VAN DER WULF, 1896, *Biologia Centrali-Americana*, vol. 2, p. 304 (*in part*).

*Neomuscina trisetula* SNYDER, 1949, *Amer. Mus. Novitates*, no. 1404, p. 10 (*in part*).

At the end of the description of *trisetula*, mention was made of a single male from La Providencia, Guatemala (C. M. Roullard), in the United States National Museum collection, which differed from the type series of *trisetula* in having four pairs of postsutural dorsocentral bristles. At the time I thought it might be a variable form of that species. However, two female cotypes of van der Wulp's *Muscina linea* are conspecific with the above male, and therefore it appears to be a distinct species, though separated mainly by this single character. The above male is hereby designated as holotype and the female from Amula, Guerrero, August, 6000 feet (H. H. Smith), in the British Museum (Natural History) and undamaged by dermestids is designated the allotype. The remaining female specimen from Amula, and partly destroyed, is a paratype.

***Neomuscina nudinervis nudinervis* (Stein)**

*Muscina linea* VAN DER WULF, 1896, *Biologia Centrali-Americana*, vol. 2, p. 304 (*in part*).

*Cyrtoneurina nudinervis* STEIN, 1918, *Ann. Hist. Nat. Mus. Natl. Hungarici*, vol. 16, p. 227.

The above synonymy should be substituted for that under *Neomuscina nudinervis* (Stein) in my 1949b paper.

The female specimen determined as *nudinervis* Stein by Malloch (1925, p. 29) from Demarara, British Guiana, August 1, 1928 (L. D. Cleare), is not conspecific with my identification of *nudinervis* but is the same as *similata* Snyder. Malloch's specimen lacks accessory setulae in the posteroventral corner among the flap-like covering of hairs of the posterior thoracic spiracle. It will be necessary to examine Stein's type of *nudinervis* before one can be certain either that *similata* is a synonym of *nudinervis* or that a new name is necessary for my concept of the latter species and that Malloch had correctly identified Stein's *nudinervis*.

***Neomuscina nudinervis pictipennis* (Bigot)**

*Cyrtoneurina pictipennis* BIGOT, 1878, *Ann. Soc. Ent. France*, ser. 5, vol. 8, p. 39.

*Cyrtoneurina pictipennis* STEIN, 1919, *Arch. Naturgesch.*, div. A, vol. 83 (1917), p. 127.

*Neomuscina nudinervis fulva* SNYDER, 1949, *Amer. Mus. Novitates*, no. 1404, p. 29.

Mr. J. E. Collin graciously permitted me to study the type (a female from Brazil) of *Cyrtoneura pictipennis* Bigot in his collection. My subspecies *fulva* of *nudinervis* Stein is a synonym.

***Neomuscina (Spilopteromyia) apicata* (Stein)<sup>1</sup>**

*Spilogaster apicata* STEIN, 1904, *Ann. Hist. Nat. Mus. Natl. Hungarici*, vol. 2, p. 442.

*Spilopteromyia apicata* MALLOCH, 1921, *Ann. Mag. Nat. Hist.*, ser. 9, vol. 8, p. 422.

This species was cited by Malloch as the genotype of *Spilopteromyia*. The male and female specimens from Vallaviencia, Colombia, Quatiquia River, 400 feet, November–December, 1914 (A. Balfour), in the British Museum (Natural History) have now been studied and found to possess the following characters not previously mentioned.

**MALE:** Width of front equal only to diameter of anterior ocellus, the parafrontals broadly contiguous. Eye facets enlarged above in front. Junction of parafacials and parafrontals protruding a distance equal to basal diameter of arista. Palpi yellow. Antennae brown, longest arisal hairs as long as width of third antennal segment.

Acrosticals 0:1; dorsocentrals 2:4; intralars 2; pra 0.3 to 0.5 of the length of the posterior notopleural bristle and with accessory setulae adjacent to the base of the anterior notopleural bristle. Scutellar setulae descending onto ventral surface from base to apex. Hypopleura bare; pre-episternum III with a few setulae. The posterior thoracic spiracle very large, but without accessory setulae among the flap-like covering of hairs.

Fore tibiae without median bristles. Mid femora with one weak apical anterodorsal and with an apical bristle on the dorsal, posterodorsal, and posterior surfaces, and with a few long, fine, ventral bristles on the basal one-fourth to one-third. Mid tibiae with two median posterior bristles. Hind femora with an entire row of anteroventral

<sup>1</sup> The page numbers of Stein's and Malloch's references were unintentionally reversed (Snyder, 1949b, p. 37). They are correctly given in the references to *Neomuscina (Spilopteromyia) apicata* (Stein) in the present paper.



bristles and with three or four posteroventrals at base. Hind tibiae slightly curved, and with one anterodorsal and five anteroventral bristles.

Wings with clouds surrounding anterior and posterior cross veins and another which extends from apex of costa to apex of first vein and posteriorly somewhat beyond the second vein. Third vein with setulae beyond node on the ventral surface. Both calyptrae with dark margins. Halteres dark brown.

**FEMALE:** The head is missing in the single specimen, which otherwise agrees with the male.

There are certain discrepancies between these two specimens and Stein's description, e.g., color of calyptrae and halteres. Unfortunately the absence of the female head in the above specimen eliminates the possibility of determining whether or not it had the very narrow front specifically noted by Stein.

#### CYRTONEURINA GIGLIO-TOS

*Cyrtoneurina* GIGLIO-TOS, 1893, Boll. Mus. Zool. Anat. Univ. Torino, vol. 8, no. 147, p. 5; 1894, Mem. R. Accad. Torino, ser. 2, vol. 14, p. 13. COQUILLETT, 1910, Proc. U. S. Natl. Mus., vol. 37, p. 530. STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 222; 1919, Arch. Naturgesch., div. A. vol. 83 (1917), p. 127. MALLOCH, 1921, Ent. News, vol. 32, p. 41; 1925, Ann. Mag. Nat. Hist., ser. 9, vol. 16, p. 89. CURRAN, 1934, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 463. SÉGUY, 1937, in Wytsman, Genera insectorum, fasc. 205, p. 350.

*Clinopera* VAN DER WULP, 1896, Biologia Centrali-Americana, vol. 2, p. 305. COQUILLETT, 1910, Proc. U. S. Natl. Mus., vol. 37, p. 525. SCHNABL AND DZIEDZICKI, 1911, Nova Acta Acad. Caes. Leopoldino-Carolinae Germanicae Nat. Cur., vol. 95, no. 2, p. 166. MALLOCH, 1921, Ent. News, vol. 32, p. 41; 1925, Ann. Mag. Nat. Hist., ser. 9, vol. 16, p. 90.

*Cyrtoneuropsis* MALLOCH, 1925, Ann. Mag. Nat. Hist., ser. 9, vol. 16, p. 91. CURRAN, 1934, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 464. MALLOCH, 1934, Diptera of Patagonia and South Chile, pt. 7, fasc. 2, p. 342.

*Mallocharia* CURRAN, 1934, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 462.

? *Dyadimyia* SÉGUY, 1937, in Wytsman, Genera insectorum, fasc. 205, p. 240.

Giglio-Tos (1893, 1894) proposed the genus *Cyrtoneurina* in the subfamily Muscinae for six new and three previously known Mexican

species. In 1910 Coquillett designated *Cyrtoneurina uber* Giglio-Tos as genotype. The nine originally included species are now distributed as follows: four in *Cyrtoneurina*, three in *Neomuscina*, one in *Hemichlora*, and one [*Cyrtoneurina anthomyidaea* Bigot (of Giglio-Tos)] in *Myospila*.

In 1896 van der Wulp proposed the genus *Clinopera* for seven new species and two species described by Giglio-Tos in *Cyrtoneurina*. Coquillett also designated the genotype, *Cyrtoneurina hieroglyphica* van der Wulp, in 1910. The nine species are distributed as follows: six in *Cyrtoneurina*, one in *Neomuscina*, one in *Muscina*, and one (*Cyrtoneurina monstrata* van der Wulp) belongs to either *Helina* or *Phaonia*, *sensu lato*, probably the latter.

Cotypes of the genotypes of *Clinopera* and *Cyrtoneurina* were studied. The van der Wulp series of *hieroglyphica* was found to be the same as the well-known *Mydaea perspicua* Stein (1911), and Giglio-Tos' series of *uber* (two males) contained two species: *Clinopera hieroglyphica* van der Wulp and *Spilogaster geminata* Stein (1904). The first male specimen of *uber* is the best preserved and is therefore designated as the lectotype. *Clinopera hieroglyphica* van der Wulp therefore becomes a synonym of *Cyrtoneurina uber* Giglio-Tos, and *Clinopera* van der Wulp a strict synonym of *Cyrtoneurina* Giglio-Tos.

Schnabl and Dziedzicki (1911) redefined *Clinopera* and listed therein several species from the Neotropical, Oriental, and Ethiopian regions. All of the included Neotropical species, except *apicata* with which I am unacquainted, belong to *Cyrtoneurina*; those from the Oriental and Ethiopian regions have been placed in *Dichaetomyia* Malloch and *Dimorphia* Malloch by later authors.

Stein (1904, 1911, 1918) described a number of Neotropical species belonging to *Cyrtoneurina* and in 1918 and 1919 used that name for those species related to *Mydaea* (*sensu* Stein) which had a single intra-alar bristle on each side, the fourth wing vein curved forward, the first or third or both veins setulose, and with characteristic abdominal markings on the second and third visible tergites. His concept thus included *Neomuscina* and *Cyrtoneurina* as here treated, and I suspect that one or two others included

in *Cyrtoneurina* by Stein belong elsewhere.

Malloch, in 1921 and 1925, divided *Cyrtoneurina* (*sensu* Stein) into several subgenera or genera. *Cyrtoneurina* Giglio-Tos was restricted to species having a setulose prosternum and first wing vein; *Clinopera* van der Wulp was considered to be distinct and separate by having a setulose prosternum but bare first vein. *Cyrtoneuropsis* was proposed for species having a bare prosternum and setulose first vein, and *Spilogaster veniseta* Stein (1904) was designated as genotype. This treatment, based on Malloch's specimens of *veniseta*, is discussed under that species and *fuscicosta* Curran.

Curran (1934a) proposed the genus *Mallocharia* for species allied to *Cyrtoneurina* and *Cyrtoneuropsis* with propleural hairs and pointed out the similarity of its genotype (*beebei* Curran) to *veniseta* Stein. He also presented keys for identification of several species of *Cyrtoneurina* and *Cyrtoneuropsis* and suggested possible generic value of the presence or absence of hairs on the stem vein basad of or opposite the humeral cross vein.

Séguy (1937) separated *Neomuscina* from *Cyrtoneurina* and considered *Cyrtoneuropsis* Malloch and *Clinopera* van der Wulp to be synonyms of *Cyrtoneurina*. His list of species placed under *Cyrtoneurina*, with one exception, is identical with Stein's 1919 catalogue and therefore contains references to certain species which are more properly placed in other genera. His *Dyadimyia* may fall in *Cyrtoneurina* as here treated, but an examination of the genotype will be necessary before it can be placed in the accompanying key.

*Cyrtoneurina*, as here treated, will trace to that genus, *Cyrtoneuropsis*, *Mallocharia*, and *Chaetogenia* in Curran (1934b). In the description of *Chaetogenia*, Malloch (1928) mentions the presence of fifth vein setulae and unusually long clothing hairs on the wing membrane. It has been treated as distinct on the basis of these characters, though I have seen no specimens of it. Species closely allied to *Cyrtoneurina uber* will trace to *Chaetogenia* in Curran (1934b, p. 394) but can be separated from that genus by the two characters noted above. Only one species (*Cyrtoneurina continens*, new species) of *Cyrtoneurina* as here treated will trace to *Clinopera* van der Wulp

in Curran's key, although *Clinopera* has since proved to be a strict synonym of *Cyrtoneurina*.

The characters which Malloch (1921 and 1925) and Curran (1934a and 1934b) used (e.g., presence or absence of setulae on the first wing vein, prosternum, and propleura) do not segregate related species of this genus into smaller groups when more species are studied than were available to them when they proposed or redefined *Cyrtoneuropsis*, *Mallocharia*, *Clinopera*, and *Cyrtoneurina*.

In the *Cyrtoneurina multomaculata* species complex, for instance, there are three species, *praenubila*, new species, *neotrita*, new species, and *multomaculata* Stein, which can be separated from one another only by the use of these "subgeneric" or "generic" characters and would trace to *Cyrtoneurina*, *Cyrtoneuropsis*, and *Mallocharia*, respectively. The terminalia of these three species, it should be added, are practically identical. A comparable situation also exists with *beebei* Curran and *protoetosa*, new species, as regards *Mallocharia* and *Cyrtoneurina*.

*Cyrtoneurina* Giglio-Tos has therefore been treated as a single genus and the presence or absence of prosternal, propleural, and wing vein setulae is considered to be invaluable for purposes of specific identification.

The structure and modification of the female genitalia offer some clues to relationships of the various species to one another and are correlated with the stage at which the eggs or larvae are deposited (see also Curran's discussion, 1934a, p. 465, on the larval habits of this group). While these organs were being prepared in dried specimens, the eggs or larvae were often found in the abdomen. In species resembling *uber* and *geminata* the abdomen frequently contained many macrotype eggs. This condition is correlated with a long, narrow ovipositor (figs. 5, 6, and 7), while in species such as *maculipennis* and *polystigma* (figs. 22 and 16) the abdomen frequently contained a single third instar larva along with the cast skins and oral hooks of the preceding two instars. This viviparous condition is apparently correlated with a much shortened larvipositor which may or may not have considerable structural modifications. The degree of modification can be used to distinguish two or three subgroups

typified by *spiloptera* (fig. 10), *polystigma* (fig. 16) and *gemina* (fig. 20).

Male genitalia did not reveal distinct species groups. The differences appearing in the shape of the superior and inferior forceps (e.g., figs. 34, 38, 40, and 46) may indicate close relationship, but species groups based on them failed to correspond to species groups based on either female terminalia or chaetotaxic characters (see table 1).

Some closely allied species which exhibit striking chaetotaxic differences have remarkably similar genitalia, while certain species which are separable only on slight color differences exhibit distinct differences in the female terminalia (e.g., *wulpi*, fig. 14; *polystigma*, fig. 16; and *incognita*, fig. 17).

The data presented below, when used in conjunction with the illustrations of the terminalia, summarize, in tabular form, the

TABLE 1  
TEXT FIGURES OF THE GENITALIA, AND THE PRESENCE (+) OR ABSENCE (-) OF  
SETULAE IN THE SPECIES OF *Cyrtoneurina*

Species	Female	Male Profile	Male Forceps	Male Fifth Ster-nite	First Vein	Stem Vein*	Proster-num	Pro-pleura	Female Inter-frontal Cru-ciates
<i>uber</i>	5	23	34	47, 48	-	+	-	-	-
<i>geminata</i>	6	23	34	47, 49	-	+	-	-	-
<i>biseta</i>	6	23	34	47, 49	-	+	-	-	-
<i>nearmipes</i>	6	23	34	47, 49	-	+	-	-	-
<i>confusa</i>	0 <sup>b</sup>	0	0	0	-	+	-	-	-
<i>crispaseta</i>	6	24	35	50, 51	+	-	-	-	-
<i>veniseta</i>	7	25	36	52	+	+	-	-	+
<i>mellina</i>	7	25	36	52	+	+	-	-	+
<i>inuber</i>	7	25	36	52	+	+	-	-	+
<i>multomaculata</i>	9	0	0	0	+	-	+	+	+
<i>praenubila</i>	9	26	37	53	+	-	-	-	+
<i>neotrita</i>	9	26	37	53	+	-	-	+	+
<i>beebei</i>	9	27	38	54	+	-	-	+	+
<i>protosetosa</i>	0	27	38	54	+	-	+	+	+
<i>spiloptera</i>	10	28	39	55	+	-	+	-	-
<i>rescita</i>	12	29	40	56	+	-	-	-	+
<i>mimica</i>	0	0	0	0	+	-	+	-	+
<i>wulpi</i>	14	26	40	56	+	-	-	-	+
<i>fuscisquama</i>	14	26	40	56	+	-	-	-	+
<i>polystigma</i>	16	29	40	56	+	-	-	-	+
<i>incognita</i>	17	29	40	56	+	-	-	-	+
<i>trita</i>	18	30	41	57	+	-	-	-	+
<i>dubia</i>	19	31	42	58	+	+	+	-	+
<i>gemina</i>	20	33	43	59	+	-	+	-	-
<i>armipes</i>	20	33	43	59	+	-	+	-	-
<i>steini</i>	20	33	43	59	+	-	-	-	-
<i>seriata</i>	20	33	43	59	+	-	+	-	-
<i>fuscicosta</i>	21	32	44	60	+	-	-	-	-
<i>conspersa</i>	21	33	45	61	+	-	+	-	-
<i>gluta</i>	22	25	46	62	+	-	-	-	-
<i>maculipennis</i>	22	25	46	63	+	-	-	-	-
<i>continens</i>	0	0	0	0	-	+	+	-	-

\* The plus sign means that the stem vein is setulose basad to the humeral cross vein; the minus sign, that the stem vein is bare basad to the humeral cross vein or that there is a clump of setulae opposite the humeral cross vein.

<sup>b</sup> The zero indicates that there is no illustration.



- mostly anteroventrally . . . *geminata* (Stein)  
 Hind femora with a row of posteroventral bristles on basal one-half and with three to five bristles near apex, which are conspicuously longer and stronger than those on basal one-half; mid femora with a distinct median posteroventral bristle; the clump of bristles on hind tibiae situated mostly posteroventrally . . . *confusa*, new species
8. Mid femora without a distinct subbasal ventral bristle; posterior cross vein almost straight . . . . .  
 . . . *uber* Giglio-Tos and *biseta*, new species  
 Mid femora with one or two subbasal ventral bristles; posterior cross vein slightly undulate . . . . .  
 . . . *geminata* (Stein) and *confusa*, new species
9. *Female*: Without a pair of cruciate interfrontal bristles. *Male*: Pra absent, or, if present, not more than 0.66 of the length of posterior notopleural bristle . . . . .10  
*Female*: With a pair of cruciate interfrontal bristles. *Male*: Pra strong, usually 0.75 to 1.25 or more times as long as the posterior notopleural bristle . . . . .22
10. Fore tibiae with a median bristle; dorsocentrals 2:3; third antennal segment not conspicuously elongated<sup>1</sup> . . . . .39  
 Fore tibiae without a median bristle; dorsocentrals 2:4<sup>2</sup> . . . . .11
11. Prosternum with lateral setulae . . . . .12  
 Prosternum bare . . . . .19
12. Males . . . . .13  
 Females . . . . .16
13. Hind tibiae with one long submedian ventral bristle which is at least 0.33 of the tibial length . . . . .*armipes* (Stein)  
 Hind tibiae without a long, submedian ventral bristle, but sometimes with a row of posterior to posteroventral, bristle-like setulae on the apical one-half . . . . .14
14. Stigmatal spot present, though sometimes faint; posterior to posteroventral surface of hind tibiae with several long bristles or setulae . . . . .15  
 Stigmatal spot absent; posterior to posteroventral surface of hind tibiae with at most a single bristle. . . . *gemina* (Wiedemann)
15. Thoracic dorsum densely golden yellow pruinose, indistinctly vittate; narrowest part of front not wider than diameter of anterior ocellus, and at this point the parafrontals contiguous and not wider than the diameter of an anterior parafrontal trichopore; posterior margins of calyptae not infuscated; hind femora without well-differentiated pre-apical posteroventral bristles . . . . . *conspersa* (Stein)  
 Thoracic dorsum grayish to yellowish pruinose, conspicuously vittate; narrowest part of front equal to distance across posterior ocelli, and at this level each parafrontal as wide as diameter of anterior ocellus; posterior margins of calyptae infuscated; hind femora with one to three pre-apical posteroventral bristles which are subequal to greatest height of femora . . . . .  
 . . . . . *seriata* (Stein)
16. Stigmatal spot absent . . . . .  
 . . . . . *gemina* (Wiedemann)  
 Stigmatal spot present, though sometimes faint . . . . .17
17. Thoracic dorsum, viewed posterolaterally, densely golden yellow pruinose, without vittae or narrow lines . . . *conspersa* (Stein)  
 Thoracic dorsum, viewed posterolaterally, grayish pruinose and with four presutural and three postsutural vittae . . .18
18. First posterior postsutural dorsocentral bristle about 0.5 of the length of second, and the latter 0.66 to 0.75 of the length of third . . . . .  
 . . . . . *seriata* (Stein)  
 First posterior postsutural dorsocentral bristle as long as second, but the latter not more than 0.5 of the length of third . . . . .  
 . . . . . *armipes* (Stein)
19. Wings with a broad cloud extending from base to apex of costa and with clouds surrounding anterior and posterior cross veins and apices of third and fourth veins . . . . .  
 . . . . . *fuscicosta* (Curran)  
 Wings without a broad cloud along costa and at apices of third and fourth veins . . .20
20. *Males*: Hind femora with a clump of about four long, closely placed, submedian ventral bristles, their ends rather curly. *Females*: Mid femora without stout ventral bristles on basal one-fourth to one-third; if there are one or two weak ones, the thoracic pleura largely fulvous . . . *crispaseta*, new species  
*Males*: Hind femora without a clump of curly-tipped submedian ventral bristles. *Females*: Mid femora with one to three well-developed ventral bristles on basal one-fourth to one-third; thoracic pleura infuscated . . .21
21. *Males*: Hind tibiae with a long submedian ventral to posteroventral bristle and with

<sup>1</sup> If specimens lack a median posterior bristle on fore tibiae, have 2:3 dorsocentrals and a conspicuously elongated third antennal segment, and males have a moderately well-developed pra, see *spiloptera* Wiedemann.

<sup>2</sup> In *fuscicosta* Curran the anterior postsutural dorsocentral bristle is very short and may easily be overlooked; if species tracing here have a broad, uninterrupted costal cloud, see *fuscicosta*, couplet 19.



- a row of posteroventrals beyond. *Females (and Males)*: With the anterior two pairs of postsutural dorsocentrals subequal . . . . . *steini*, new species
- Males*: Hind tibiae without a long submedian ventral to posteroventral bristle or a row of posteroventrals on apical one-half. *Females (and Males)*: With anterior pair of postsutural dorsocentral bristles conspicuously shorter than second pair. . . . . *gemina* (Wiedemann)
22. Prosternum with distinct lateral setulae . . . . . 23  
Prosternum not setulose laterally . . . . . 27
23. Dorsocentrals 2:3 . *spiloptera* (Wiedemann)  
Dorsocentrals 2:4 . . . . . 24
24. Propleura bare . . . . . 25  
Propleura setulose . . . . . 26
25. Stem vein bare basad of the humeral cross vein . . . . . *mimica*, new species  
Stem vein setulose basad of the humeral cross vein . . . . . *dubia*, new species
26. Sides of scutellum setulose on apical half below level of marginal bristles; stem vein with several setulae opposite humeral cross vein on ventral surface . . . . . *multomaculata* (Stein)  
Sides of scutellum bare on apical half below level of marginals; stem vein without setulae opposite humeral cross vein on ventral surface . . . . . *protosetosa*, new species
27. Propleura setulose . . . . . 28  
Propleura bare . . . . . 29
28. Upper basal corner of discal cell with a small dark cloud; hind tibiae with two median anterodorsal bristles. *Males*: At middle of front each parafrontal not so wide as greatest arisal diameter . *neotrita*, new species  
Upper basal corner of discal cell without a dark cloud; hind tibiae with one submedian anterodorsal bristle. *Males*: At middle of front each parafrontal broader than greatest arisal diameter . . . . . *beebei* (Curran)
29. Hind coxae with several dorsal setulae . . . . . *veniseta* (Stein)  
Hind coxae without dorsal setulae . . . . . 30
30. Stem vein entirely bare . . . . . 31  
Stem vein with ventral setulae either basad of or opposite humeral cross vein . . . . . 36
31. With a dark cloud at apex of second wing vein and at anterobasal corner of discal cell and frequently with lighter ones near apices of third and fourth wing veins. Hind femora usually without two or three long, strong, posteroventral to ventral basal bristles . 32  
Without dark clouds at apices of second to fourth veins or at anterobasal corner of discal cell. Hind femora with two, and usually more, strong, ventral to posteroventral basal bristles (these especially noticeable in male) . . . . . *rescita* (Walker)
32. Knobs or more of halteres infuscated . . . 34  
Knobs of halteres yellow to fulvous and not conspicuously darker than stalk . . . . . 33
33. *Male*: Margins of calyptrae infuscated. *Females*: Calyptrae with a strong brownish to fulvous tinge . . . *incognita*, new species  
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34. Palpi fulvous apically; hind tibiae with two median anterodorsal bristles. . . . . *praenubila*, new species  
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35. Humeri entirely yellow to fulvous. *Males*: Calyptrae white to pale yellow, margins not infuscated . . . . . *wulpi*, new species  
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36. Stem vein with several setulae on ventral surface opposite the humeral cross vein; bare basad . . . . . *trita* (Stein)  
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37. Thoracic pleura yellow to fulvous; fore femora entirely, and a variable basal portion of mid and hind femora, fulvous . *mellina* Stein  
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38. With a distinct cloud surrounding apical portion of second vein; antennae yellow . . . . . *veniseta* (Stein)  
Without a distinct cloud near apical portion of second vein; antennae fulvous. . . . . *inuber* Giglio-Tos
39. Wings unspotted, or at most with a very faint, narrow, dark cloud surrounding the anterior cross vein . . . . . *gluta* Giglio-Tos  
Wings with a broad, dark cloud surrounding anterior and posterior cross veins, and with other clouds at stigma and on apical portion of second vein . . . . . *maculipennis* (Walker)

#### Cyrtoneurina uber Giglio-Tos

*Cyrtoneurina uber* GIGLIO-TOS, 1893, Boll. Mus. Zool. Anat. Univ. Torino, vol. 8, no. 147, p. 6; 1894, Mem. R. Accad. Sci. Torino, ser. 2, vol. 14, p. 17 (lectotype).

*Clinopera hieroglyphica* VAN DER WULP, 1896, Biologia Centrali-Americana, vol. 2, p. 307. MALLOCH, 1921, Ent. News, vol. 32, p. 41; 1925, Ann. Mag. Nat. Hist., ser. 9, vol. 16, p. 90.

*Mydaea perspicua* STEIN, 1911, Arch. Naturgesch., div. A, vol. 77, p. 86.

*Cyrtoneurina perspicua* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 227.

The following detailed description is presented because *uber* is the genotype of *Cyrtoneurina* Giglio-Tos.

MALE: Length, 4.5 to 6.0 mm. Head black, grayish pruinulent. Eyes very large, occupying most of head. In profile, parafacials and parafrontals obscured. Cheeks about 1.5 times as high as width of third antennal segment. The lower margin of face sometimes fulvous. With a small knob-like facial carina between base of third and apex of second antennal segments. Parafrontals very narrow, about as wide as greatest arisal diameter; broadly contiguous along most of their length. Front at its narrowest part subequal to diameter of anterior ocellus. With a single pair of moderately strong anterior parafrontal bristles and several pairs of short hairs which extend to the narrowest part of front. With or without a pair of very short, reclinate parafrontal hairs near anterior ocellus. The anterior pair of ocellar bristles subequal to anterior parafrontals. Inner and outer vertical bristles as strong as, or slightly stronger than, the marginal row of postocular setulae. The fulvous antennae inserted at a level slightly below middle of eyes, extending almost to their lower margins. Third segment 2.7 to 3.0 times as long as second. The arisal hairs rather widely separated, the longest almost equal to length of third antennal segment. Palpi of almost uniform width, dark fulvous to brown.

Thorax infuscated, the humeri and apex of scutellum dark brown to fulvous. The pruinescence color on thoracic disc variable, yellowish gray to seal brown, but usually more brownish than gray. When viewed from behind, with a darker brown postsutural area from which three to five vittae extend posteriorly. These are of variable width and distinctness depending on individual specimen and the angle at which it is viewed. Bristles and setulae arise from small brownish spots. Scutellum with a brownish dorsal basal spot and another on each side near base. Presutural acrostical setulae in nine to 12 irregular rows; the anterior two postsutural pairs of dorsocentrals very short. Pra-

absent; with a few short setulae adjacent to base of anterior notopleural bristle. Scutellar setulae not descending below level of marginals, but with setulae on the basal one-fourth to one-half of ventral surface. Anterior spiracular flap yellow to gray. The posterior one rather narrow, but long; the flap-like covering of hairs infuscated and with four to six long interspersed dark setulae which extend to dorsal margin. Propleura bare; beret bare, or with one or two short setulae. Pre-episternum III usually setulose; supra-spiracular callosity with several strong dorsal setulae in addition to the pile. Pleuratergite below calyptrae with numerous setulae.

Legs infuscated, knees somewhat reddish, and the tibiae frequently reddish brown. Mid femora with numerous short, closely placed setulae at base of anteroventral to posteroventral surfaces, but without distinct bristles. Hind femora with two to four anteroventral bristles on apical one-fourth, basad of which there are very short setulae which are not over 0.33 of femoral diameter; posteroventrally bare. Hind tibiae with a short, median, anterodorsal, anteroventral, and postero-dorsal bristle or bristle-like setula.

Wings hyaline, unclouded or occasionally with a very slight darker tinge at stigma. Costal thorns and setulae very short. Stem vein with several hair-like setulae basad of humeral cross vein on ventral surface and with several setulae on node and basal one-fourth to one-half of third vein (fig. 4). Third and fourth veins as in figure 3. Posterior cross vein with a slight median basal curve. Calyptrae hyaline or with a faint brownish tinge, the margins of the lower ones yellow to very slightly brown. Halteres yellow to fulvous.

Abdomen mostly translucent yellow, densely yellow to yellowish gray pruinulent. Viewed laterally, with a broad, dark, median band on first visible tergite and a pre-apical band on each side of the second which join a pair of median, subtriangular spots; third tergite with a less well-defined transverse band, but with the paired spots as distinct as those on second; fourth tergite with the median spots frequently subconfluent, and without a transverse band. Basal sternite setulose.

FEMALE: Length, 5 to 6.5 mm. Similar to the male, but differs in having the front at

vertex 0.27 to 0.30 of head width, slightly widened anteriorly. The parafrontals about as wide as the distance between the posterior ocelli and becoming broader at juncture of parafacials. Frontal vitta velvety black and with a long, narrow, gray to yellowish pruinose triangle extending to base of antennae. With about six strong, inwardly directed parafrontal bristles, but without setulae laterad to them; the posterior two pairs backwardly and somewhat outwardly directed. Inner and outer vertical bristles strong, subequal. Posterior ocellar bristles much shorter than verticals, but longer than the postocular row.

Humeri and apex of scutellum more fulvous than in male, and with a pair of dark vittae between the dorsocentral rows of bristles.

Mid femora with fewer setulae and these less distinct; with a pre-apical anterior bristle in addition to the two pre-apical posterior and posteroventral bristles. Hind femora with only one or two pre-apical anteroventrals.

Abdomen more fulvous than yellow, the dark bands more extensive and less well defined than in male.

**SPECIMENS EXAMINED:** There are two male cotypes of *Cyrtoneurina uber* Giglio-Tos from Tuxpango, Mexico (Sumichrast), in the University of Turin collection. The male specimen which bears the species label in Giglio-Tos' handwriting is designated as lectotype. It is conspecific with the entire cotype series of seven males and four females of *Clinopera heiroglyphica* van der Wulp from Teapa, and Frontera, Tabasco, and Tierra Colorado, Guerrero (Mexico), in the British Museum (Natural History).

In addition to the above cotypes, 150 specimens of both sexes were studied from: Mexico: Tapachula. Guatemala: La Providencia. El Salvador: San Salvador. British Honduras (no other data). Nicaragua: Managua. Panama Republic: David; Alhajuelo; Porto Bella; La Chorrara; El Valle. Canal Zone: Barro Colorado Island; Balboa. Colombia: Turbo; Cali District. Venezuela: Caracas. Peru: Iquitos. British Guiana: Kaieteur, Bartica District. Trinidad. Grenada.

***Cyrtoneurina geminata* (Stein)**

*Cyrtoneurina uber* GIGLIO-TOS, 1894, Mem. R. Accad. Sci. Torino, ser. 2, vol. 14, p. 17 (in part).

*Clinopera uber* Giglio-Tos, VAN DER WULF, 1896, Biologia Centrali-Americana, vol. 2, p. 307 (in part).

*Spilogaster geminata* STEIN, 1904, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 2, p. 439.

*Mydaea geminata* STEIN, 1911, Arch. Naturgesch., div. A, vol. 77, p. 96.

*Cyrtoneurina geminata* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 222.

Very similar to *uber* in most color and structural characters. It exhibits the same variation of thoracic pruinose color and intensity of calyptal tinge.

Mid femora with one or two short but distinct, blunt-tipped ventral bristles at base. Hind femora with a clump of eight or more long, anteroventral bristles on apical one-fourth to one-fifth; bristles on posterior surface more slender and slightly curly at tip; those on posteroventral surface less hair-like, straight. Hind tibiae with several rows of short bristles on basal one-third to one-half of anteroventral to posteroventral surfaces.

Posterior cross vein somewhat more curved and the wings frequently more brownish tinged.

This species extends farther south than *uber*, though both are found in the same localities north of Panama. Stein has recorded it from Peru, Mexico, and British Honduras.

**SPECIMENS EXAMINED:** One hundred and ninety of both sexes from: Mexico: Tuxpango; Frontera, Tabasco (determined as *uber* Giglio-Tos by van der Wulp), in the British Museum (Natural History). Guatemala: La Providencia; Tamaul. Honduras: Puerto Castilla. Costa Rica: San Mateo. Panama Republic: David; Sabanis. Canal Zone: Barro Colorado Island; Balboa; Camaron. Colombia: Cali District; Medellin. Ecuador (no other data). Venezuela: Mt. Duida. Peru: Chanchamayo; Iquitos. Brazil: Chapada; Bahia; Natal; Rio de Janeiro. Paraguay: Villarica.

***Cyrtoneurina biseta*, new species**

**MALE:** Length, 3 to 4 mm. Very similar in color and structure to that of *geminata* Stein and of *uber* Giglio-Tos, but differs as follows:

The lower calyptae deep brown, especially on the apical one-half. Posterior cross vein straight.

Mid femora without bristles on antero-

ventral or ventral surfaces; posteroventrally with a row of five to seven bristles on basal one-half and these about as long as femoral height, the apical bristle conspicuously longer than others. Hind femora with a complete row of seven to 10 anteroventral bristles which are at least as long as femoral height; with only one or two distinct pre-apical posteroventrals. Hind tibiae with an almost complete row of anteroventral bristles which are as long as tibial diameter, and with two very long, closely placed, pre-apical, anteroventral bristles.

**FEMALE:** Length, 3 to 4 mm. Similar to the male, differs in the usual secondary head characters.

Humeri fulvous, contrasting with remainder of disc; scutellum unspotted.

Mid femora without distinct bristles or setulae on the ventral surfaces. Hind femora with one to three short, pre-apical, anteroventral bristles. Hind tibiae with a short median anterodorsal, anteroventral, and posterodorsal bristle, the last shortest.

**TYPE MATERIAL:** Holotype, male, Rio de Janeiro, Brazil, October, 1938, "MES" Yellow Fever Survey (R. C. Shannon); allotype, female, same data as type; both in United States National Museum; paratypes, eight males, 18 females, same data as type; five males, 18 females, topotypical, September; one female, Mangaratiba, Rio de Janeiro, Brazil, November, 1938 (R. C. Shannon); two females, Itaquaquecetuba, São Paulo, Brazil, May 25 and June 6 (C. H. T. Townsend).

*Cyrtoneurina confusa*, new species

**MALE:** Length, 3 to 4 mm. Very similar to that of *geminata* Stein, but differs in having a short median posteroventral bristle on mid femora. Hind femora with three to five posteroventral bristles in the pre-apical tuft and without fine, curly-tipped, hair-like setulae on posterior surface adjacent to them. The prebasal tuft on hind tibiae contains fewer setulae, and these are confined to the ventral to posteroventral surfaces only.

**TYPE MATERIAL:** Holotype, male, Patilla Point, Panama Canal Zone, January 15, 1929 (C. H. Curran); paratypes, one male, Barro Colorado Island, Canal Zone, March, 1944 (Zetek No. 5126); one male, Higuito, San Mateo, Costa Rica (Pablo Schild); one

male, Fazalmedo, Ilheus, Brazil, December, 1914 (Lerio Gomes).

This species may be a hybrid of *geminata* and another allied species. I hesitate to do more than suggest this possibility until all the closely related species are reared in the laboratory and crossing experiments are made.

*Cyrtoneurina nearmipes*, new species

**MALE:** Length, 3.5 to 5 mm. Head as in *uber* Giglio-Tos.

Thorax black, brownish pruinose, with a dark brown median vitta laterad to the dorsocentral row of bristles; bristles and setulae with bases surrounded by small dark spots. The anterior two postsutural pairs of dorsocentrals somewhat shorter than the posterior two pairs, but not so reduced as in *geminata* Stein. Lateral ventral margin of scutellum, upper portion of supraspiracular callosity, and pleuratergite below calyptrae setulose. Propleura bare; pre-episternum III usually with one or two setulae. The posterior thoracic spiracle with several setulae interspersed in the small flap-like covering of hairs.

Legs dark, knees fulvous. Mid femora with a row of short anteroventrals on basal one-half and with a short, stout, blunt, basal ventral bristle. Hind femora with two strong pre-apical anteroventrals; and two shorter and more slender posteroventral pre-apical bristles; the remainder of these surfaces without distinct bristles, but with extremely short anteroventral setulae. Hind tibiae with one median anterodorsal, anteroventral, and shorter posterodorsal bristle; in addition there are two characteristic, very long, closely placed, ventral to slightly anteroventral median bristles whose bases are almost contiguous, and with a few short setulae adjacent.

Wings hyaline, with a narrow stigmal brown cloud and another surrounding the anterior cross vein, the posterior cross vein with or without a narrow cloud surrounding it. With one or two hairs on ventral surface of stem vein basad of the humeral cross vein. First vein bare beyond humeral cross vein. Third vein with some short setulae on node and very slightly beyond. Apical portion of lower calyptrae dark. Halteres fulvous.

Abdomen as in *uber*.

**FEMALE:** Length, 3.5 to 5 mm. Oral margin narrowly fulvous, remainder of head dark. Frontal vitta with a narrow brownish pruinulent triangle, the apex reaching to base of the fulvous brown antennae. Front at vertex 0.3 of greatest head width, and slightly wider anteriorly. Parafrontals grayish pruinulent, about as wide as distance across posterior ocelli inclusive. Cruciate interfrontal bristles absent.

Humeri and apex of scutellum fulvous, remainder of thorax infuscated, rather golden yellow pruinulent; with a broad, median, brown stripe which is narrowly interrupted on each side by an almost black vitta, and another brown vitta extending from humeri to postalar callosities and situated between the postsutural planes of the dorsocentral and intra-alar bristles. Scutellum with the median basal portion and the lateral margins distinctly brownish pruinulent.

Legs as in male, but the basal ventral bristle on mid femora not so stout and the hind femora with but one or two pre-apical anteroventral bristles. Hind tibiae without the characteristic pair of median ventral bristles, but with the other short median anterodorsal, anteroventral, and posterodorsal bristles.

**TYPE MATERIAL:** Holotype, male, Itaquaquecetuba, São Paulo, Brazil, June 6 (C. H. T. Townsend); allotype, female, same data as type; both in United States National Museum; paratypes, two males and three females, topotypical, May 30 to June 6; one female, Mangaratiba, Rio de Janeiro, November, 1938; six males, 10 females, Rio de Janeiro, October, 1938, "MES," Yellow Fever Survey (R. C. Shannon).

***Cyrtoneurina crispaseta*, new species**

**MALE:** Length, 4.5 to 6. mm. Head black, grayish to yellowish gray pruinulent; cheeks reddish; pruinulence on back of head grayish brown. Narrowest part of front not wider than diameter of anterior ocellus, the parafrontals broadly contiguous, each scarcely as wide as basal diameter of arista. With a single moderately strong pair of anterior parafrontal bristles and with several short setulae continued to the contiguous portion, and with a pair of short setulae adjacent to the anterior ocellus. Anterior and posterior ocellar bristles

equally developed, subequal to anterior parafrontals. In profile, juncture of parafrontals obscured. Cheeks about as high as width of third antennal segment. Palpi fulvous yellow. Third antennal segment pale yellow, whitish pruinulent, the first two segments slightly brownish. Arista yellow, the hairs brownish, the longest 0.66 to 0.75 of the length of third antennal segment. The antennae, which are separated by a narrow ridge, are inserted at a level slightly below the middle of eyes and extend to opposite their lower margin. The third antennal segment 2.1 to 2.25 times as long as the second.

Thoracic color variable, pleura may be entirely fulvous or entirely infuscated; humeri fulvous, but remainder of dorsum partly or entirely brownish infuscated; scutellum usually lighter colored at apex. The thoracic disc when viewed from above and behind yellowish pruinulent and with a faint, very narrow, brown, postsutural vitta on each side and situated between the planes of the dorsocentral and intra-alar bristles. The postsutural dorsocentrals arise from small subconfluent brown spots. Viewed from above and posterolaterally, there appears to be a broad, brown, transverse area extending from suture to about the level of the third posterior postsutural dorsocentral bristle. The anterior two postsutural dorsocentrals very short, subequal, and only 0.5 as long as the third pair. Pra absent. Notopleura with a few short setulae adjacent to base of anterior bristle. Scutellar setulae not descending below level of marginals, but with a few long hairs on the lateral ventral corners. Propleura and prosternum bare. Supraspiracular callosity not setulose, but with short, pale pile. The pleura-tergite below calyptae bare. Hypopleura bare; pre-episternum III setulose. Anterior thoracic spiracular flap fulvous; the posterior thoracic spiracular flap brown, without accessory setulae.

Leg color variable; fore coxae often, and the fore tibiae usually, fulvous; a variable portion of fore femora and remainder of legs infuscated to fulvous brown, though the posterior four tibiae are usually lighter colored than their femora. Mid femora with a row of short anteroventral bristle-like setulae and two long, slender, ventral bristles at base which are so closely placed that they may



appear as one stout bristle. Hind femora with one strong bristle and one to three weaker pre-apical anteroventral bristles; at about middle of the ventral to posteroventral surface there is a characteristic clump of about six long, slender bristles which are slightly curled at apex and are distinctly longer than greatest height of femora. Hind tibiae with one median anterodorsal and anteroventral bristle. Pulvilli and claws small.

Wings unspotted, hyaline, but with a slight brownish tinge. Costal thorns not differentiated. Stem vein bare basad of and opposite the humeral cross vein on both surfaces. The first vein setulose on dorsal surface almost to apex, the setulae on ventral surface much shorter and usually distinct only on pre-apical portion. Node setulose on both surfaces; the setulae on dorsal surface of third vein continued to about the anterior cross vein, and on ventral surface to only slightly beyond the node. Halteres and calyptrae yellow, the apical margin of lower calyptrae usually clouded with brown.

Abdomen with the entire first two tergites and base of third visible tergite yellow to fulvous, the remaining ones brownish; all tergites yellowish pruinulent. First visible tergite with a narrow median transverse dark brown line which is situated where the dorsal clothing setulae begin. Second and third visible tergites with a pair of short, median, longitudinal, brown stripes which connect posteriorly with a transverse band, the latter continued to the ventral surface. Fourth tergite usually without distinct marks. The strong apical bristles on the second to fourth tergites arise from small, round, brown spots. Basal abdominal sternite distinctly setulose. Second to fourth sternites with a pair of apical bristles.

**FEMALE:** Length, 4.5 to 6 mm. Front broad, the vitta somewhat reddish brown, grayish pruinulent; perioral region yellowish. With a complete row of parafrontal bristles; the posterior ocellar bristles shorter than anterior ocellars, and subequal to inner and outer verticals. Thorax with an indistinct median brown vitta. Mid femora without the two closely placed ventral bristles; hind femora without the median ventral tuft of bristles. Margins of lower calyptrae usually not so distinctly darkened. Abdominal marks

on second and third tergites very broad, but less well defined than in male.

**TYPE MATERIAL:** Holotype, male, Natal, Brazil, October 8 to 20, 1943 (F. M. Snyder); allotype, female, Itaquaquecetuba, São Paulo, Brazil, June 6 (C. H. T. Townsend); paratypes, eight females, Rio de Janeiro, September and October, 1938, "MES," Yellow Fever Service (R. C. Shannon); one male, two females, Fazalada, Ilheus, Bahia, Brazil, December, 1944 (Lerio Gomes), allotype and above paratypes in the United States National Museum; one male, Chanchamayo, Peru, "Dept. Junin," 1100 meters, August 4, 1948 (José M. Schunke).

The Peruvian paratype is considerably darker than the remainder of the specimens of the type series but does not otherwise differ.

The clump of distinctive ventral bristles on the male hind femora should readily distinguish this species from others in *Cyrtoneurina*. The generally fulvous thoracic color of the females with the combination of bare prosternum, unclouded wings, absence of basal ventral bristles on mid femora, and the short anterior two pairs of postsutural dorsocentral bristles will distinguish this species from other *Cyrtoneurina* which lack interfrontal cruciate bristles.

#### *Cyrtoneurina veniseta* (Stein)

*Spilogaster veniseta* STEIN, 1904, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 2, p. 443.

*Mydaea veniseta* STEIN, 1911, Arch. Naturgesch. div. A, vol. 77, p. 97.

*Cyrtoneurina veniseta* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 230.

*Cyrtoneuropsis veniseta* CURRAN, 1934, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 466.

**MALE:** Parafrontals contiguous along most of their length; the front at its narrowest part not wider than the diameter of anterior ocellus. With a single pair of strong anterior parafrontal bristles and several shorter setulae not extending beyond the contiguous portion of parafrontals; with two posterior pairs of reclinate parafrontal setulae anterior to the anterior ocellus; the posterior pair of these parafrontal setulae longest and strongest. Antennae yellow. Palpi dark basally, becoming more yellow apically.

Thorax brownish black, grayish pruin-

cent. With five brownish vittae, the median broadest, those along plane of dorsocentral bristles narrowest. Humeri yellowish to fulvous brown. The four postsutural pairs of dorsocentral bristles subequal. Propleura and prosternum bare; pre-episternum III with a few short setulae; supraspiracular callosity pilose, some of the dorsal pile long and almost setulose; pleuratergite below calyptrae with a transverse row of fine to coarse setulae or hairs.

Legs dark, femora mostly infuscated, the apices or more of hind pair brownish; anterior tibiae fulvous, the mid and hind ones varying from fulvous brown to black, the mid tibiae usually lighter than the hind pair. Mid femora with four to six widely separated ventral bristles on the basal one-half to two-thirds. Hind femora with two or three distinct anteroventral bristles on apical one-half to one-third, the remainder of this, and the posteroventral surface, with at most very short setulae, none of which are more than one-third of the height of femora where situated except the subapical posteroventral setulae which are frequently as long as femoral diameter at this point. Dorsolateral margin of hind coxae with numerous short setulae which are in the same position as those in certain species of *Fannia* and *Lasiops*.

The intensity of the dark clouds on the somewhat yellowish wings is variable. There is always a spot at stigma which frequently coalesces with the cloud surrounding the anterior cross vein; another one surrounds the posterior cross vein, and this one is sometimes larger than other wing clouds; another extends along a variable apical portion of the second vein and this cloud is either faint or quite dark and sometimes extends almost to the stigmatal spot. A faint cloud is frequently present at apices of third and fourth veins. Stem vein with setulae on both surfaces basad of the humeral cross vein; sometimes one or two of them are longer than the remaining setulae on either surface.

The first, and usually the second, visible abdominal tergite is yellowish basolaterally, and the remainder of the abdomen is infuscated but grayish pruinulent.

**FEMALE:** Very similar to the male, except for its broad front and the palpi, which may be slightly broadened apically. Mid femora

with the ventral bristles shorter. Frequently the fulvous color is absent at base of abdomen.

Originally described from Brazil and later recorded from Bolivia by Stein and from British Guiana by Curran.

**SPECIMENS EXAMINED:** One hundred and forty-five of both sexes from: Mexico: Tapachula. El Salvador: San Salvador. Nicaragua: Managua. Costa Rica: Higuito, San Mateo. Panama Republic: David; La Chorrera; Gatun Lake; Trinidad River; El Cermino. Canal Zone: Balboa; Fort Sherman; Paraisco; Summit; Tabernilla; Barro Colorado Island. Colombia: Turbo; Rio Frio; Magdalena. Venezuela: Caracas. British Guiana: Bartica District; Kaieteur; Kangaruma; Kuyuwini River; Tukiet. Trinidad: Port of Spain.

At my request, Dr. Willi Hennig examined the two female cotypes of *veniseta* from Para, Brazil, in the Zoological Museum of the University of Berlin and generously supplied notes which are gratefully acknowledged. These cotypes have the characteristic hind coxal hairs, setulae on stem vein, bare propleura and prosternum, and the dark wing clouds noted in the above description.

The presence of hind coxal setulae will readily distinguish this species from all other *Cyrtoneurina* known to me. If specimens are pinned so as to obscure this character, or if these short setulae have been rubbed off, then positive separation of this species from *inuber* is difficult, and one must rely on the degree or intensity of the color of the cloud near the apex of the second wing vein.

This species was cited as the genotype of *Cyrtoneuropsis* by Malloch (1925) when he described that genus. A male specimen having the same data given by Malloch for *veniseta* Stein and bearing Malloch's determination label in his handwriting is in the British Museum (Natural History) and is conspecific with *fuscicosta* Curran.

#### ***Cyrtoneurina mellina* Stein**

*Cyrtoneurina mellina* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 226.

A predominantly fulvous species. Palpi not broadened apically in either sex. The supraspiracular callosity with longish pile only; the pleuratergite below calyptrae similarly pilose; pre-episternum III usually with fine, pale setulae and frequently with two

or three dark setulae at the posterodorsal corner of the posterior thoracic spiracle; with setulae adjacent to the base of the posterior notopleural bristle.

The stem vein with fine, hair-like setulae basad of the humeral cross vein on both surfaces.

Mid femora with a row of four to eight ventral bristles on basal one-half. Hind femora with two or three well-developed anteroventral bristles on apical one-third and a row of very much shorter ones which reach almost to the base; posteroventral surface without distinct setulae. Hind tibiae with one median anterodorsal and anteroventral bristle.

The color of the previously undescribed male is similar to that of the female, except the thoracic dorsum is more prominently vittate.

**MALE:** Front at narrowest part narrower than diameter of anterior ocellus, the parafrontals broadly contiguous on most of their length. The anterior pair of parafrontal bristles about as long as the anterior pair of ocellars and with numerous accessory parafrontal setulae which continue to the contiguous portion; with a pair of reclinate setulae in front of the anterior ocellus. Parafacials and parafrontals obscure in profile. Cheeks 1.3 times as high as width of third antennal segment. Antennae inserted slightly below middle of eyes and extending to or slightly below their ventral margin.

Wings yellowish to brownish tinged, with a darkened stigmal cloud, and the cell beyond somewhat more brownish tinged than remainder of wings; both cross veins faintly clouded; the one surrounding the anterior cross vein is the most extensive.

This species was originally described from Santa Catherina, Brazil.

**SPECIMENS EXAMINED:** Thirty-seven specimens of both sexes from: Brazil: Nova Teutonia; São Paulo; Rio de Janeiro; Chapada. Paraguay: Villarica. The male specimen from Chapada in the American Museum of Natural History bears a Hough manuscript name and type label.

*Cyrtoneurina inuber* Giglio-Tos

*Cyrtoneurina inuber* GIGLIO-TOS, 1893, Boll. Mus. Zool. Anat. Univ. Torino, vol. 8, no. 147, p. 6; 1894, Mem. R. Accad. Sci. Torino, ser. 2, vol. 14,

p. 15. STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 223.

*Cyrtoneurina pellex* GIGLIO-TOS, 1893, Boll. Mus. Zool. Anat. Univ. Torino, vol. 8, no. 147, p. 6; 1894, Mem. R. Accad. Sci. Torino, ser. 2, vol. 14, p. 16.

*Cyrtoneurina diagrapha* VAN DER WULF, 1896, Biologia Centrali-Americana, vol. 2, p. 308.

*Clinopera uber* Giglio-Tos, VAN DER WULF, 1896, Biologia Centrali-Americana, vol. 2, p. 307 (in part).

**MALE:** Head reddish brown to infuscated; grayish pruinulent. Front at narrowest part about as wide as diameter of anterior ocellus. Parafrontals contiguous or separated by the basal diameter of one of the strong anterior ocellar bristles. With a pair of strong anterior parafrontal bristles and numerous short hairs which extend to the narrowest part of the front; with a short but well-developed posterior pair just anterior to apex of ocellar triangle. Antennae yellowish fulvous to yellow. Palpi of almost uniform width; a variable basal portion infuscated, remainder fulvous.

Thorax dark, the humeri and a variable apical portion of scutellum fulvous to fulvous brown. Disc densely grayish pruinulent. With five vittae of variable width: a median one and one on each side of dorsocentral row of bristles. The four postsutural pairs of dorsocentrals subequal. Pra about as long as posterior notopleural bristle and with setulae adjacent to base of the latter. Pre-episternum III setulose; suprascutular callosity and the pleuratergite below calyptrae with short hairs.

Legs dark brown to infuscated, the apices of femora and tibiae frequently brownish fulvous. Mid femora with a row of short anteroventral and longer posteroventral bristles on basal one-half, and with a pre-apical posterodorsal, posterior, and somewhat posteroventral one. Hind femora with two or three strong pre-apical anteroventrals which are distinctly longer than femoral diameter, and with a row of much shorter ones extending to base; posteroventrally with a row of variable bristles which may be scarcely 0.3 of femoral height to slightly longer than femoral height, especially near base. Hind tibiae with one (or very occasionally with two) anterodorsal and anteroventral bristles and a shorter posterodorsal one.

Wings hyaline, sometimes with a slight yellowish to brownish tinge which is more intense adjacent to the second and third veins; with a distinct stigmal spot and another of variable intensity surrounding the anterior and posterior cross veins, sometimes those surrounding the cross vein very faint or absent. Stem vein setulose basad of humeral cross vein on dorsal surface and frequently on ventral surface. Posterior cross vein almost straight. Calyptres hyaline; halteres yellow.

Abdomen dark, the basal portion of the first two visible tergites translucent yellow to brown, with a dark apical band and all overlaid with gray pruinescence. A pair of subtriangular dark basal spots are present on the second, third, and sometimes fourth visible tergites; the large bristles arise from dark spots. Basal sternite setulose.

**FEMALE:** Similar to the male, front almost parallel sided, about 0.3 of head width. Without setulae laterad to the parafrontal bristles. Antennae usually more fulvous and with a variable dark apical shadow. Palpi slightly to distinctly widened pre-apically.

Mid femora with a short but distinct pre-apical anterior to anterodorsal bristle. Hind femora with anteroventral and posteroventral bristles shorter than in male.

**SPECIMENS EXAMINED:** Mexico, one male, two females, Teapa, Tabasco, January, March (H. H. Smith), and one male, one female, Chilpancingo, Guerrero, 4600 feet, June (H. H. Smith); all determined as *uber* Giglio-Tos by van der Wulp in British Museum (Natural History); five females, Cuernavaca, Morelos, 5000 feet, August 15 (F. M. Snyder). Guatemala: One male, Quirigua, May 7 (J. M. Aldrich); four females, Guatemala City, 5000 feet, August 20 (F. M. Snyder). El Salvador: One male, 10 females, San Salvador, 3500 feet, June, August (F. M. Snyder). Costa Rica: One female, Higuato, San Mateo (P. Schild); one male, three females, San José, June–November. Panama Republic: One male, one female, David, August 29 (F. M. Snyder). Canal Zone: Four males, two females, Balboa, June 12 (F. M. Snyder); one male, one female, Parisco, January 15 (A. Busk); one male, one female, Barro Colorado Island, May 14–26 (C. T. Green); one male, Fort Sherman, September

8 (R. C. Shannon).

In addition to the specimens enumerated above, the following types were studied:

There are four male and three female cotypes of *inuber* Giglio-Tos in the University of Turin collection. One male specimen bears Giglio-Tos' determination label and another smaller label, with the word "Solco." This specimen is hereby designated as lectotype of *inuber*. All seven specimens are conspecific, although two of the females have a very faint cloud surrounding the posterior cross vein.

Cotypes of *Clinopera diagramma* van der Wulp were not located in the British Museum (Natural History) collection, but there is a single male from Chilpancingo, Guerrero, 4600 feet, June (H. H. Smith), in the University of Amsterdam collection. It bears van der Wulp's handwritten determination label and is hereby designated as the lectotype of *Cyrtoneurina diagramma* van der Wulp. It should be noted that van der Wulp mentioned "several specimens of both sexes from Amula, Orizaba, and Chilpancingo" in describing the species.

The single female type of *Cyrtoneurina pellex* Giglio-Tos from Tuxpango, Mexico (Sumichrast), is in good condition in the University of Turin collection.

If only the above type material is considered, the three species listed in the synonymy can be separated by the following couplets:

1. Males . . . . . 2  
Females . . . . . 3
2. Bristles on basal one-third to one-half of hind femora prominent and at least as long as the dorsoventral height of femora where situated; anterior cross vein surrounded by a dark cloud . . . . . *inuber* Giglio-Tos  
Bristles on basal one-third to one-half of hind femora absent or very short, never more than seven-tenths of dorsoventral height of femora where situated; anterior and posterior cross veins not surrounded by a dark cloud . . . . . *diagramma* van der Wulp
3. With a narrow but distinct cloud surrounding at least the anterior cross vein . . . . . 4  
Without an infuscated cloud surrounding any cross vein . . . . . *diagramma* van der Wulp
4. Pre-apical portion of palpi distinctly broader than at base, at least 0.8 of the greatest width of third antennal segment . . . . .  
. . . . . *pellex* Giglio-Tos

Pre-apical portion of palpi slender, scarcely broader than base, at widest part not more than 0.5 of greatest width of third antennal segment . . . . . *inuber* Giglio-Tos

However, the larger series of specimens studied contains numerous intergrading forms, so I have concluded that only a single species is involved, and the above description indicates my concept of *inuber*.

***Cyrtoneurina multomaculata* (Stein)**

*Spilogaster multomaculata* STEIN, 1904, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 2, p. 434 (lectotype).

? *Mydaea multomaculata* STEIN, 1911, Arch. Naturgesch., div. A, vol. 77, p. 98.

? *Cyrtoneurina multomaculata* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 226.

*Cyrtoneurina multimaculata* MALLOCH, 1925, Ann. Mag. Nat. Hist., ser. 9, vol. 16, p. 90.

**MALE:** Head black, cheeks reddish brown. Front at narrowest part slightly wider than distance across posterior ocelli inclusive. Parafrontals narrowly contiguous, each as wide as diameter of anterior ocellus and with the parafrontal bristles continued to opposite anterior ocellus, the anterior pair strong, the posterior pair reclinate and inserted opposite anterior ocellus. Cheeks 1.5 times as high as width of third antennal segment. Facial ridges with a few setulae on the lower two-fifths. Antennae and arista fulvous yellow. Longest arisal hairs on both surfaces longer than the entire length of one antenna. The third antennal segment 2.75 to 3.0 times as long as second. Antennae inserted opposite middle of eyes and descending to a level midway between lower level of eyes and oral margin. The palpi very slightly broadened apically, but gently curved and almost parallel sided; apices fulvous, bases infuscated. Eyes bare.

Thorax black; humeri fulvous yellow; apex of scutellum slightly brownish. Thoracic dorsum with rather sparse grayish pruinescence, obscurely vittate. The four postsutural dorso-central bristles become longer posteriorly, but are not divided into long and short groups. Pra equal to anterior notopleural bristle, and slightly longer than the posterior one. Notopleural setulae more numerous adjacent to the posterior bristle. Scutellar setu-

lae continued over the sides and onto the edge of the ventral surface, the declivitous portion therefore almost as densely setulose as scutellar disc. Anterior thoracic spiracle flap white or very pale yellow; the posterior one infuscated, without accessory setulae. Supraspiracular callosity pilose and with a few short dorsal setulae which are continued over the edge and onto the pleuratergite below calyptrae.

Legs black, knees very narrowly fulvous brown, tibiae with somewhat brownish reflections. Mid femora with a row of about four short, anteroventral and ventral bristles, none of which is longer than the short pre-apical anterodorsal. Hind femora with several anteroventral bristles on apical one-fourth to one-third, basal bristles scarcely distinguishable. Hind tibiae with two anterodorsal and two anteroventral median bristles and one much shorter, scarcely distinguishable posterodorsal bristle.

Wings yellowish brown, subhyaline, and with dark spots as follows: a stigmal cloud extending posteriorly and confluent with one surrounding the anterior cross vein; another at node; one at anterior basal corner of discal cell; one surrounding the posterior cross vein; and another extending from costa to beyond second vein, the base of the latter spot almost confluent with the stigmal cloud. The apex of wings slightly darkened and frequently with a narrow cloud at apex of third and fourth veins. Stem vein with a clump of ventral setulae opposite juncture with humeral cross vein; both surfaces bare basad of the humeral cross vein. Calyptrae hyaline, but with a strong brownish tinge. Knobs of halteres black, the remainder often fulvous brown.

Abdomen black, grayish pruinose, and with a scarcely distinguishable pair of faint, subshiny, median, black spots on each side of second and third visible tergites. Discal and apical bristles very short; the discal row on the fourth tergite more well developed. Basal abdominal sternite usually bare.

**FEMALE:** Similar to male. Frontal vitta near antennal base reddish brown. Front at vertex 0.3 of head width, not widened anteriorly. Parafrontals as wide as distance across posterior ocelli inclusive; with a very strong pair of anterior bristles, another pair



near middle, and two shorter backwardly and outwardly directed posterior pairs; with several shorter interspersed pairs between the stronger parafrontal bristles. Anterior ocellars very prominent, longer than any bristle in the vertical area, but shorter than vibrissae. The cruciate pair of interfrontal bristles long and strong. Juncture of parafacials and parafrontals, although clearly visible in profile, are not protuberant.

**SPECIMENS EXAMINED:** Costa Rica: One male, Juan Vipas (Pablo Schild); one female, Higuito (Pablo Schild). Peru: One male, one female, Iquitos, March–April (R. C. Shannon). Brazil: One female, near Para (H. B. Merrill). All in United States National Museum.

There are three species (*multomaculata* Stein, *neotrita*, new species, and *praenubila*, new species) that fit Stein's description of *multomaculata* and trace to it in his several keys. Dr. Willi Hennig graciously examined type specimens of "*multimaculata*" in the Zoological Museum at the University of Berlin and supplied notes on the presence or absence of setulae on the stem vein opposite the humeral cross vein, propleura, and prosternum, and on the sides of scutellum below the level of marginal bristles.

Dr. Hennig notes that there are seven specimens in the above collection which bear red cotype labels. Stein mentions only four specimens ("2 ♂ und ♀ in der Berliner Sammlung aus den Cordilleren Columbiens"), so it is obvious that only the first four of the seven specimens enumerated below can be considered to be cotypes.

One male from "Cordilleren Columbiens, Terra Caliente, Thieme S." bears Stein's handwritten label, "*Spilogaster (Clinopera* v. d. W.) *multimaculata* sp. nov. ♂ ♀," and is hereby designated as the lectotype. It has a clump of setulae on the stem vein opposite the humeral cross vein, numerous setulae descending onto sides of scutellum well below the level of marginal bristles, and propleural and prosternal setulae.

One female with the same data as above is conspecific and might be considered to be a lecto-allotype.

One male and one female which also bear the above data appear to be conspecific with

*praenubila*, new species, according to Hennig's notes.

The remaining three specimens in the Zoological Museum of the University of Berlin, which bear red cotype labels, should not properly be considered types, as they are obviously part of the material discussed by Stein in 1911 (Peru, Chanchamayo, and Peru, Rosalina); they are conspecific with *praenubila*.

The specimen from Juan Vipas, Costa Rica, listed above under Specimens Examined bears Malloch's determination label, "*Cyrtoneurina multimaculata* Stn.," and probably served for his 1925 notes on this species.

#### *Cyrtoneurina praenubila*, new species

*Spilogaster multimaculata* STEIN, 1904, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 2, p. 434 (in part).

*Mydaea multimaculata* STEIN, 1911, Arch. Naturgesch., div. A, vol. 77, p. 98 (in part).

**MALE:** Length, 6.0 to 7.0 mm. Head as in *neotrita*, new species. Differs in having third antennal segment pale yellow, second fulvous brown, third segment extending to opposite lower level of eyes and 2.7 to 3.0 times as long as second. Palpi fulvous on apical one-fourth to one-third.

Thorax as in *neotrita*. Differs in having the humeri and apex of scutellum more brownish, the vittae scarcely distinguishable from the gray pruinescence. Propleura and prosternum bare, pre-episternum III, supraspiracular callosity, and pleuratergite below calyptrae not setulose.

Legs as in *neotrita* but hind femora with a few short anteroventral bristles on basal one-fourth to one-third and a stronger basal ventral or posteroventral bristle. Hind tibiae with two median anterodorsal and one or two anteroventral bristles.

Wings and halteres as in *multomaculata*, but the calyptrae are not so distinctly tinged with brown.

Abdomen as in *multomaculata*.

**FEMALE:** Length, 5 to 7 mm. Similar to male. Front at vertex 0.27 of head width, almost parallel sided. Frontal vitta slightly reddish at base of antennae. With a pair of cruciate interfrontal bristles. Palpi more extensively fulvous apically. Humeri slightly

more fulvous than in male and the vittae more prominent. Calyptrae more whitish tinged.

**TYPE MATERIAL:** Holotype, male, Port of Spain, Trinidad, September 29, 1943 (F. M. Snyder); allotype, female, Campinas, Goyaz, Brazil, December, 1935 (Borgmeier and S. Lopes); paratypes, two females, same data as allotype; one female, Trinidad, June 20 (A. Busk); one female, Montserrat, Trinidad, June 29, 1905 (A. Busk); one female, Grenada, British West Indies, September 6 (A. Busk); three males, Iquitos, Peru, March-April, 1931 (R. C. Shannon); one female, Fort Sherman, Canal Zone, September 9, 1923 (R. C. Shannon); one female, Porto Bello, Panama, February 28, 1911 (A. Busk); one female, Barro Colorado Island, July 8, 1923 (R. C. Shannon); one female, Urururytuba, Rio Tapajos, Brazil, March, 1920 (C. H. T. Townsend).

***Cyrtoneurina neotrita*, new species**

**MALE:** Length, 4.5 to 6 mm. Head black, grayish pruinulent, the cheeks more brownish. Front at narrowest part as wide as diameter of anterior ocellus, the parafrontals very narrow and usually broadly contiguous. The anterior pair of parafrontal bristles moderately well developed, the others very short and continued along most of the length of the parafrontal; with a pair of stronger reclinate ones slightly in front of the anterior ocellus. In profile, parafacials and parafrontals obscured or scarcely visible. Cheeks 1.5 times as high as width of third antennal segment. Antennae fulvous; palpi dark, apex fulvous brown. Antennae inserted slightly below middle of eyes, reaching to a level midway between their lower level and oral margin; third segment 2.3 to 2.5 times as long as second. Longest arisal hairs 0.7 to 0.8 of the length of third antennal segment.

Thorax black, cinereous gray pruinulent. Humeri fulvous, apex of scutellum fulvous brown. With five faint brownish vittae, the median broadest. The four postsutural dorso-centrals subequal. Propleura setulose; prosternum bare; pre-episternum III bare or with very short, fine hairs. Supraspiracular callosity pilose, with one or two dorsal setulae which may extend onto the pleuratergite be-

low calyptrae. Posterior thoracic spiracle without prominent setulae among the flap-like covering of hairs.

Legs black, knees narrowly fulvous, tibiae somewhat brownish. Mid femora without prominent anteroventral or ventral bristles. Hind femora with three anteroventral bristles on apical one-third. Hind tibiae with one to two median anterodorsal and one to three anteroventrals. Pulvilli and tarsal claws small.

Wings yellowish tinged, with a broad, dark cloud extending from stigma to slightly beyond the anterior cross vein. Costal margin basad of stigma brownish and with a broad cloud at apex of second vein, a much fainter one at third, and a very faint one over apex of fourth vein. The almost perpendicular cross veins surrounded by a broad cloud and with another smaller cloud over node and at anterior basal corner of discal cell. Stem vein bare opposite and basad of humeral cross vein on both surfaces. Calyptrae yellowish, halteres fulvous yellow.

Abdomen marked as in *protosetosa*, new species, though the pruinescence is somewhat more brownish apically on third and fourth visible tergites.

**FEMALE:** Length, 4.5 to 6.5 mm. Similar to male, the front about 0.3 of head width, scarcely widened anteriorly. With a pair of cruciate interfrontal bristles. Mid femora with two short ventral bristles on the basal one-fourth.

**TYPE MATERIAL:** Holotype, male, Iquitos, Peru, March-April, 1931 (R. C. Shannon); allotype, female, same data as holotype; both in United States National Museum; paratypes, five males, one female, same data as type.

***Cyrtoneurina beebei* (Curran)**

*Crytoneuropsis veniseta* Stein, MALLOCH, 1934, Diptera of Patagonia and South Chile, pt. 7, fasc. 2, p. 342.

*Mallochcharia beebei* CURRAN, 1934, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 462.

The previously undescribed male has the front at its narrowest part subequal to distance across posterior ocelli inclusive, the parafrontals contiguous or very narrowly separated at middle, and each parafrontal as

wide as diameter of anterior ocellus. With one pair of strong parafrontal bristles anteriorly, and six to nine shorter pairs along the entire parafrontal length, the posterior pair reclinate and situated opposite anterior ocellus and subequal to posterior ocellar bristles. Antennae pale yellow, the second segment slightly darker. Palpi infuscated.

Scutellum in both sexes with apical margins somewhat fulvous brown. The four postsutural dorsocentral bristles subequal; preepisternum III bare, or with very short hairs; pleuratergite below calyptrae bare; supraspiracular callosity pilose, the dorsal pile sometimes setose. The accessory setulae in the posteroventral corner of posterior thoracic spiracle very short.

Mid femora without prominent anteroventral or ventral bristles, the four or five anteroventrals on the basal one-fourth not longer than 0.33 of the femoral diameter. Hind femora as in female, with two to four strong anteroventrals on apical one-fourth to one-third, the setulae basad scarcely differentiated, and if there are two or three at base on posteroventral surface, they are not more than 0.5 of the diameter of femora where situated. Hind tibiae with one median anterodorsal and anteroventral bristle. Hind coxae without dorsal setulae as are present in *veniseta*.

Wings marked as in female, the cloud surrounding posterior cross vein narrowed at middle and broad at its juncture with the fourth and the fifth veins. Posterior cross vein with a distinct basal curve at its center. Halteres yellow. Calyptrae yellowish white, the margins not dark in either sex.

Abdomen with a pair of small, subtriangular, black spots at base of second visible tergite in both sexes.

**SPECIMENS EXAMINED:** Holotype, female, from British Guiana, in the American Museum of Natural History. Argentina: One female, Bopland (Edwards), determined as *Cyrtoneuropsis veniseta* (Stein) by Malloch, in the British Museum (Natural History). Brazil: One male, Mosqueiro, Rio de Para, March 3, 1896 (Austin), determined as *Cyrtoneuropsis trita* (Stein) by Malloch,<sup>1</sup> in British

<sup>1</sup> This specimen should not be confused with one from the same locality and also determined as *trita* Stein by Malloch (1925, p. 91); the latter specimen is conspecific with *rescita* Walker.

Museum (Natural History); one female, Bahia, May, 1929 (R. C. Shannon); 21 males, 28 females, Natal, February and November, 1943 (F. M. Snyder). Paraguay: Three males, Vilaricia, March and July, 1937 (F. Schade); Trinidad: One male, June 20 (A. Busk).

*Cyrtoneurina protosetosa*, new species

**MALE:** Length, 5 to 7 mm. Head black, grayish pruinulent. Front at narrowest part as wide as distance across posterior ocelli inclusive, the parafrontals not contiguous, separated by a distance equal to greatest arisal diameter; bristled as in *beebei* Curran. In profile, parafacials and parafrontals scarcely visible, their juncture only very slightly projecting. Cheeks 1.25 times as high as greatest width of third antennal segment. Antennae fulvous yellow, inserted opposite middle of eyes and reaching slightly below their lower level. Third antennal segment 2.7 times as long as second. Longest arisal hairs 0.8 as long as length of third antennal segment. Palpi dark.

Thorax black, cinereous gray pruinulent, the two lateral brownish vittae very narrow, scarcely visible. Humeri and apex of scutellum fulvous. The four postsutural dorsocentral bristles subequal; pra as long as posterior notopleural bristle. Propleura, prosternum, and preepisternum III setulose; supraspiracular callosity pilose; pleuratergite below calyptrae bare.

Femora brownish, their apices and the tibiae fulvous brown. Mid femora without prominent anteroventral or ventral bristles. Hind femora with three strong anteroventrals on apical one-third, the remainder of anteroventral and entire posteroventral surface without distinct bristles. Hind tibiae with two median anterodorsal and anteroventral bristles.

Wings with a yellowish tinge which is especially evident adjacent to the longitudinal veins. With brown clouds at stigma, surrounding anterior cross vein, and juncture of posterior cross vein with fourth and fifth veins. Stem vein bare on both surfaces. Halteres and calyptrae yellow, the apical margins of the latter distinctly brownish tinged, most pronounced on the lower calyptrae.

Abdomen black, cinereous gray pruinulent.

cent. Second visible tergite with a pair of basal, subtriangular, dark spots at middle; third with or without a fainter pair. The second with a transverse pre-apical brownish area. The larger bristles inserted in dark spots and the smaller ones arise from much smaller spots.

**FEMALE:** Length, 5 mm. Similar to male. Front at vertex about 0.28 of head width, not widened anteriorly and with a pair of cruciate interfrontal bristles. In profile, juncture of parafacials and parafrontals more prominent. Apex of third antennal segment with a dark shadow. Mid femora with two short but distinct ventral bristles on basal one-third. Calyptrae white, the apices not darkened. Abdomen without the brownish pre-apical area on second visible tergite; the bristles and setulae arise from somewhat larger spots than in male.

**TYPE MATERIAL:** Holotype, male, Natal, Brazil, February 5 to 24, 1943 (F. M. Snyder); allotype, female, same data as holotype; paratypes, two males, same data as holotype.

This species resembles *beebei* Curran superficially, but the setulose prosternum, the two anterodorsal median bristles on hind tibiae, and the darkened apical margins of male calyptrae will readily separate it from *beebei*.

#### *Cyrtoneurina spiloptera* (Wiedemann)

*Anthomyia spiloptera* WIEDEMANN, 1830, *Ausereuropäischen zweiflügeligen Insekten*, vol. 2, p. 433.

*Spilogaster spiloptera* STEIN, 1902, *Zeitschr. Syst. Hymenopterologie u. Dipterologie*, vol. 2, p. 133. STEIN, 1904, *Ann. Hist. Nat. Mus. Natl. Hungarici*, vol. 2, p. 441.

*Mydaea spiloptera* STEIN, 1911, *Arch. Naturgesch.*, div. A, vol. 77, p. 93.

*Cyrtoneurina spiloptera* STEIN, 1918, *Ann. Hist. Nat. Mus. Natl. Hungarici*, vol. 16, p. 229.

No description of the male has been published. The following notes on the head are therefore presented.

Parafrontals contiguous or only very narrowly separated at middle of front; each one is not quite so wide as diameter of anterior ocellus. The anterior pair of parafrontal and ocellar bristles are very well developed, subequal; parafrontals with only very short hairs in addition to the anterior bristle and these extend to the narrowest part of front;

with a pair of very short reclinate hairs anterior to the anterior ocellus and with a more well-developed pair almost opposite it.

Both sexes have the third antennal segment 3.75 to 4.0 times as long as the second, and it is longer than in any other species of *Cyrtoneurina* known to me. The apices of the palpi are somewhat yellowish.

Dorsocentrals 2:3; pre-episternum III, supraspiracular callosity, and the pleuratergite below calyptrae without setulae. There are a few interspersed dark setulae along the posterior margin of the posterior thoracic spiracle in addition to the flap-like covering of hairs. Notopleura with only a few scarcely distinguishable setulae adjacent to the posterior bristle.

Mid femora with one or two distinct ventral bristles on the basal one-fourth to one-third. Females frequently have a prebasal posteroventral bristle on hind femora, and the remainder of this surface in both sexes lacks distinct bristles; anteroventral surface of hind tibiae with two to four bristles on the apical one-third.

The stigmal spot is continued posteriorly and almost joins the cloud on the second vein, which in turn is but narrowly separated from the one surrounding the node; the second vein has another cloud at its apex which is subconfluent with a cloud at apex of the antepenultimate section of costa. Third vein with two distinct spots beyond anterior cross vein; fourth with a pre-apical one. Posterior cross vein is broadly surrounded by a dark cloud, and the discal cell has a small spot at its anterior basal corner. Knobs or more of halteres infuscated.

This species has been keyed twice because of the variable length of the pra. In all females studied it is more than two-thirds as long as the posterior notopleural bristle, but in males it varies from one-half to equal the length of the posterior notopleural bristle.

Wiedemann originally described this species from Brazil, and Stein recorded it from Surinam and Bolivia.

**SPECIMENS EXAMINED:** Twenty specimens of both sexes from: Honduras: Puerto Castilla. Panama Canal Zone: Mojanga Swamp. Ecuador: Guayaquil. Brazil: Estencia Sergepe; Bahia; Lower Amazon; São Paulo; Rio de Janeiro.

***Cyrtoneurina rescita* (Walker)**

*Anthomyia rescita* WALKER, 1860, Trans. Ent. Soc. London, vol. 5, p. 315.

*Anihomyia setinervis* THOMSON, 1868, Kongliga Svenska Fregatten Eugénies Resa omkring jorden . . . 1851-53, vol. 2, pt. 1, p. 549.

*Cyrtoneurina gluta* GIGLIO-TOS, 1894, Mem. R. Accad. Sci. Torino, ser. 2, vol. 14, p. 15 (in part: female).

*Clinopera frontina* VAN DER WULP, 1896, Biologia Centrali-Americana, vol. 2, p. 309.

*Cyrtoneurina maculipennis* WILLISTON, 1896, Trans. Ent. Soc. London, vol. 3, p. 368 (*nec Anthomyia maculipennis* Walker).

*Spilogaster rescita* STEIN, 1901, Zeitschr. Syst. Hymenopterologie u. Dipterologie, p. 207.

*Mydaea rescita* STEIN, 1911, Arch. Naturgesch., div. A, vol. 77, p. 99.

*Cyrtoneurina rescita* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 228.

*Cyrtoneuropsis trita* Stein, MALLOCH, 1925, Ann. Mag. Nat. Hist., ser. 9, vol. 16, p. 91.

This species can be recognized by the wing markings and the characteristic male front. In both sexes the wings are hyaline or very faintly tinged with yellow; the stigmal spot is much reduced and is mostly enclosed by the first vein, the anterior cross vein is narrowly surrounded by a brown cloud, and the posterior cross vein may or may not have a faint darkened border.

In the male, the complete frontal vitta at its narrowest part is at least as wide as the diameter of the anterior ocellus, and at this same level each parafrontal is about as wide as the distance across the posterior ocelli inclusive. Parafrontals with a complete row of strong, upright, or slightly cruciate bristles, the pre-apical pair cruciate, and the one or two strong posterior pairs adjacent to the anterior ocellus reclinate; anterior and posterior pairs subequal to length of anterior ocellar bristles, the remaining parafrontal bristles subequal and about as long as post-ocellars. Head, thorax, and abdomen of both sexes black, densely grayish pruinulent.

Stein has recorded *rescita* from Bolivia, British Honduras, Colombia, Mexico, and Paraguay.

**SPECIMENS EXAMINED:** Two hundred and fifty of both sexes from Mexico, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Peru, British Guiana, Cuba, Trinidad, Brazil, and Paraguay.

In addition, the following material was also studied: Walker's type female from Mexico; type male of *frontina* van der Wulp from Teapa, Tabasco; and the male and female cotypes of *pterostigma* van der Wulp from Teapa and Frontero, Tabasco, respectively; Williston's male and female cotypes of *maculipennis* from Saint Vincent, British West Indies, all of which are in the British Museum (Natural History); and the cotype female of *gluta* Giglio-Tos in the University of Turin collection. There are two specimens from Brazil determined as *trita* Stein by Malloch in the British Museum (Natural History) which bear the same data noted in his 1925 reference to *trita*; one of these is *rescita* and the other is *beebei* Curran.

Thomson's *setinervis* has been included in the above synonymy on Stein's (1918 and 1919) testimony.

***Cyrtoneurina mimica*, new species**

**FEMALE:** Length, 6 mm. Head black, grayish pruinulent. Front 0.28 of head width, almost parallel sided. Without setulae laterad of the parafrontal row of bristles. Frontal vitta black, without a well-defined frontal triangle. Cruciate interfrontal bristles well developed. Face with a very slight carina between the antennae. The latter fulvous, inserted slightly below middle of eyes and extending almost to oral margin; third segment 3.2 to 3.5 times as long as second. Longest arisal hairs almost as long as length of third antennal segment. Cheeks 1.2 times as high as width of third antennal segment. Palpi brownish, not distinctly widened apically.

Thorax black, grayish pruinulent, and indistinctly vittate. Humeri fulvous. The anterior two postsutural pairs of dorsocentral bristles subequal and 0.4 to 0.6 as long as the third pair. Pra very long. Propleura bare; prosternum with numerous lateral setulae. Hypopleura (including pre-episternum III), supraspiracular callosity, and pleuratergite below calyptae without setulae. Metasternum with a row of fine setulae.

Legs dark brown or infuscated, the knees and tibiae somewhat lighter colored. Mid femora without bristles on any of the ventral surfaces, but with a pre-apical anterior, posterodorsal, posterior, and posteroventral bristle. Hind femora with three pre-apical



anteroventrals, remainder of ventral surfaces bare. Hind tibiae with two median anterodorsal and anteroventral bristles, and a very short median posterodorsal setula.

Wings slightly brownish hyaline; with a dark brown cloud at stigma, surrounding both cross veins, at anterobasal corner of discal cell, and at apex of second vein; with a slightly suffused area adjacent to third and fourth veins. Stem vein entirely bare, the first and third setulose along most of their length. Calyptrae pale or with a very faint dark tinge. Halteres dark brown to fulvous.

Abdomen black, grayish pruinulent, and with a pair of dark median basal spots on second and third visible tergites. Setulae arise from small, subshiny spots. Basal sternite bare.

TYPE MATERIAL: Holotype, female, Quipo, Panama, August, 1922 (J. P. Chapin), in United States National Museum.

This is the only species of *Cyrtoneurina* known to me which possesses distinct metasternal setulae, though the pile of this sclerite in *veniseta* is somewhat longer than usual.

The single specimen has not been dissected to determine the exact type of larvipositor. Portions of it are visible enough, however, to indicate that it bears a pair of strong, heavily chitinized, four-toothed sternites similar to those in *wulpi* and *praenubila*.

#### *Cyrtoneurina wulpi*, new species

*Clinopera polystigma* VAN DER WULF, 1896, *Biologia Centrali-Americana*, vol. 2, p. 309 (in part).

*Cyrtoneurina polystigma* van der Wulp, STEIN, 1918, *Ann. Hist. Nat. Mus. Natl. Hungarici*, vol. 16, p. 227.

MALE: Length, 5 to 6.5 mm. long. Head black, grayish pruinulent. Front at its narrowest part equal to distance across posterior ocelli inclusive; at same level, each parafacial subequal to diameter of anterior ocellus, the parafacials contiguous, or, if narrowly separated, not by more than the diameter of arista. Parafacials with a strong pair of anterior bristles and another pair opposite the anterior ocellus, and with a single series of much shorter ones between them. In profile, parafacials and parafrontals almost obscured. Cheeks 1.5 to 2.0 times as high as width of third antennal segment. Antennae

yellow, inserted opposite middle of eyes and reaching to their lower margin; the third segment 2.7 to 3.0 times as long as second. Longest arisal hairs about three-fourths as long as length of third antennal segment. Palpi infuscated. Eyes bare.

Thorax black, gray to yellowish gray pruinulent. With or without an indistinct median brown vitta which extends from transverse suture to a distinct basal spot on scutellum and with a more distinct vitta laterad of each row of dorsocentral bristles. Humeri yellow. The four postsutural pairs of dorsocentral bristles subequal. Pra about as long as posterior notopleural bristle, the latter with setulae adjacent to its base. Scutellum with setulae at base on ventral margins. Propleura, prosternum, pre-episternum III, and pleuratergite below calyptrae not setulose. Supraspiracular callosity with one or more short setulae on dorsal portion in addition to the short hairs. Anterior spiracular flap yellow. Posterior spiracular flap dark, without interspersed setulae among the flap-like covering of hairs.

Legs infuscated, the knees somewhat brownish fulvous. Mid femora without distinct bristles on any ventral surface. Hind femora with two to four anteroventral bristles on apical one-fourth to one-third, the remainder of the anteroventral and the entire posteroventral surface bare or with setulae which are not more than one-third of the diameter of femora where situated. Hind tibiae with one median anterodorsal and anteroventral bristle.

Wings faintly brownish yellow hyaline. Brownish clouds are present at the stigma, between costa and apical portion of first vein, and over anterior cross vein, the latter subconfluent with the stigmatal spot; a faint spot near apex of third vein and a pre-apical one on fourth; posterior cross vein distinctly clouded, though not so intense as the one surrounding the anterior cross vein; with a small spot at anterobasal corner of discal cell. Calyptrae faintly yellowish, the margins not darkened. Halteres with knobs and stalk adjacent to them infuscated, their bases yellow.

Abdomen entirely infuscated, gray to yellowish gray pruinulent. With a pair of small, median apical spots on first visible tergite

and with or without a much smaller pair on second. Clothing setulae and the strong bristles arise from small, dark spots.

**FEMALE:** Length, 5 to 6.5 mm. Front at vertex 0.3 of head width, scarcely broader anteriorly. With a pair of cruciate interfrontal bristles. Parafrontals with a pair of strong anterior, median, and pre-ocellar bristles; the parafrontal setulae between these bristles stronger than the parafrontal setulae in the male.

Apical portion of scutellum with or without a very narrow fulvous area.

Abdomen with or without spots on first visible tergite, but with dorsal and lateral checkerings on all tergites.

**TYPE MATERIAL:** Holotype, male, Balboa, Panama Canal Zone, June 12, 1943 (F. M. Snyder); allotype, female, Port of Spain, Trinidad, September 29, 1943 (F. M. Snyder); paratypes, two females, Tapachula, Mexico, August 17-19, 1943 (F. M. Snyder); one male, one female, Higuato, San Mateo, Costa Rica (Pablo Schild); one female, Chinandega, Nicaragua (Baker); one male, same data as type; one female, Gatun, Panama Canal Zone, November 5, 1951 (F. J. Blanton); one male, Trinidad, West Indies, June 20 (A. Busk).

**ADDITIONAL RECORDS:** Mexico: One female, Tierra Colorado, Guerrero, 2000 feet, October (H. H. Smith), cotype of *Clinopera polystigma* van der Wulp in the University of Amsterdam collection. (The male cotype of *polystigma* is discussed under that name.)

***Cyrtoneurina fuscisquama*, new species**

**MALE:** Length, 6 to 7 mm. Head black, cheeks brownish, remainder of head grayish pruinulent. Front at narrowest part as wide as distance across posterior ocelli inclusive; at this level, each parafrontal and the frontal vitta as wide as diameter of anterior ocellus. With a complete row of parafrontal bristles, one pair near base of antennae and another adjacent to anterior ocellus stronger than the others, the latter pair reclinate. Juncture of parafacials and parafrontals scarcely visible in profile. Antennae fulvous, inserted opposite middle of eyes and reaching to opposite their lower level; the third segment 2.6 times as long as second. Longest arisal hairs on both surfaces together are distinctly longer

than antennal length. Palpi dark brown to fulvous.

Thorax black, humeri slightly fulvous brown along inner margin, grayish pruinulent. Disc with a median brown vitta and another somewhat darker and narrower one laterad to the dorsocentral row of bristles. The four postsutural pairs of dorsocentral bristles subequal. Pra as long as length of both notopleural bristles, the latter with setulae adjacent to the base of both, but somewhat more numerous near base of the posterior one. Propleura, prosternum, preepisternum III, and pleuratergite below calyptrae bare. Supraspiracular callosity pilose, frequently with the pile on inner dorsal region somewhat setulose. Flap-like covering of hairs of anterior thoracic spiracle yellow; that of the posterior one brownish black and with at most a few short accessory setulae posteriorly.

Legs infuscated, tibiae, especially the anterior pairs, brownish to fulvous. Mid femora with three to four ventral bristles on basal one-third to one-half. Hind femora with three to five long anteroventral bristles on apical one-half to one-third and with much shorter ones basad, occasionally with two or three short posteroventrals on the basal one-fourth. Hind tibiae with one median antero-dorsal and one or sometimes two antero-ventrals.

Wings with a distinct brownish tinge; with a dark brown cloud extending from antero-basal angle of discal cell across node and subcosta; another at stigma which is confluent with the one surrounding the anterior cross vein; with a longitudinal cloud beyond costa which extends posteriorly over most of the apical two-fifths of the ultimate section of second vein; third and fourth veins with a faint, but distinct, cloud at their apices; posterior cross vein surrounded by a broad cloud. Stem vein entirely bare. Calyptrae with a distinct brownish tinge, the margins somewhat darker. Halteres infuscated, their bases somewhat lighter colored.

Abdomen black, grayish pruinulent, and with a pair of basal, subtriangular, dark spots on second and third visible tergites. The bristles and clothing setulae arise from round, subshiny, brown spots.

**FEMALE:** Length, 5 to 7 mm. Similar to the

male, front at vertex about 0.3 of head width. Femoral bristles shorter. Calyptrae brownish yellow.

TYPE MATERIAL: Holotype, male, Rio de Janeiro, Brazil, October, 1938, "MES," Yellow Fever Survey (R. C. Shannon), in United States National Museum; allotype, female, same data as holotype; paratypes, five males, one female, same data as holotype; one male, two females, topotypical, September; one female, topotypical, Botanical Gardens, January, 1953 (H. S. Lopes).

This species and *wulpi* are very similar in general habitus, and the structure of the male and female terminalia is identical. However, I have found no specimens exhibiting intergradations in the diagnostic characters, and since the known distribution of the two is quite different, I have considered them to be distinct species, though it is possible some persons may consider them to be geographical subspecies.

*Cyrtoneurina polystigma* (van der Wulp)

*Clinopera polystigma* VAN DER WULP, 1896, Biologa Centrali-Americana, vol. 2, p. 309 (lectotype).

MALE: Head black, densely grayish pruinulent. Front at its narrowest part as wide as distance across posterior ocelli inclusive, and the parafrontals at same level as wide as diameter of anterior ocellus. Parafrontals narrowly contiguous at middle, or sometimes very slightly separated. With a complete row of parafrontal bristles, the anterior pair strongest, the remaining ones becoming gradually shorter, cruciate; the posterior pair adjacent to anterior ocellus long, reclinate, subequal to length of posterior ocellar bristles; the anterior ocellars long and subequal to anterior pair of parafrontals. In profile, parafacials and parafrontals scarcely visible. Cheeks almost two times as high as greatest width of third antennal segment. Antennae and arista yellow; the second antennal segment somewhat darker when viewed at certain angles. Antennae inserted at a level slightly below middle of eyes and extending to slightly below their lower margin; third segment 2.6 times as long as second. Longest arisal hairs on both surfaces as long as antennae. Palpi infuscated to fulvous brown, somewhat lighter apically.

Thorax black, grayish pruinulent; humeri fulvous to yellow; the lateral apical margins of scutellum brownish to fulvous. Thoracic disc with five distinct vittae, a median vitta, and another on each side of the dorsocentral row of bristles. These vittae vary from brown to cinereous. The four postsutural pairs of dorsocentrals subequal. Notopleura with setulae adjacent to both bristles, more numerous near the posterior one. Prosternum, propleura, pre-episternum III, and pleura-tergite below calyptrae bare. Hypopleura usually with a few short fine hairs below spiracle; supraspiracular callosity pilose, or occasionally setulose on dorsal part. Anterior thoracic spiracle with a yellowish flap-like covering of hairs; the posterior one with a few scarcely distinguishable setulae along posterior margin in addition to the flap-like covering of hairs.

Legs dark, the tibiae and a variable portion of mid and hind femora fulvous to brown. Mid femora with a row of very short, inconspicuous, anteroventral bristles on basal one-third. Hind femora with three or four anteroventral bristles on apical one-third; posteroventral surface without bristles or setulae. Hind tibiae with one median anterodorsal, and one or very occasionally two, anteroventral bristles.

Wings hyaline; with a broad brownish cloud at stigma, surrounding anterior and posterior cross veins, and at apex of second vein, which when viewed at certain angles, appears to extend along apical border of wings to apex of third vein; and discal cell with a small cloud at anterior basal corner, sometimes with a very faint cloud at apex of fourth vein. Stem vein entirely bare. Calyptrae white or faintly yellow. Halteres yellow to fulvous, the knobs not infuscated.

The first to third visible abdominal tergites dark, grayish pruinulent, remainder of abdomen brownish to fulvous and with a pair of median basal triangular spots on the first to third visible tergites; the fourth tergite with subconfluent spots. Bristles and setulae inserted in small, round, brown spots.

FEMALE: Front at vertex about 0.3 of head width, very slightly broadened anteriorly. Abdominal spots usually less prominent than in male.

SPECIMENS EXAMINED: Four hundred and

twenty of both sexes from: Guatemala: Quirigua. El Salvador: San Salvador. Honduras: Puerto Castilla. Costa Rica: Higuito, San Mateo. Panama Republic: El Cermina. Canal Zone: Paraisco; Tabernilla. Brazil: Nova Teutonia; Rio de Janeiro; Chapada; Maracaju, Mata Grosso. Paraguay: Villarica.

In his description of this species, van der Wulp noted that he had one male and two females. No cotypes of this species were found in the British Museum (Natural History), but there is a single male and a female in the collection of the University of Amsterdam. The male, from "Medellin near Vera Cruz, Jan. 1888 (H. H. Smith)," is in good condition and is designated as lectotype. The female is without a head, but is, I believe, identical with the species described as *wulpi*, new species.

*Cyrtoneurina incognita*, new species

MALE: Length, 6.75 to 7.25 mm. Similar to that of *polystigma* van der Wulp, differing in having the margins of the lower calyptrae darkened and the legs, except for hind tibiae, entirely infuscated, the latter brownish to fulvous. Abdomen entirely infuscated.

FEMALE: Length, 7 to 7.5 mm. Differs from females of *polystigma* in having the calyptrae more brownish tinged and in the structure of the terminalia (figs. 16 and 17).

TYPE MATERIAL: Holotype, male, Rio de Janeiro, Brazil, October, 1938, "MES," Yellow Fever Survey (R. C. Shannon); allotype, female, same data as type; both in United States National Museum; paratypes, two males, five females, same data as holotype.

As previously indicated, the female terminalia offer structural characters for separating *polystigma* from *incognita*. The male terminalia in the two species appear identical, but such dissimilar species as *rescita* and *polystigma* have these structures similar, although *wulpi* and *fuscisquama*, which appear superficially very similar, have also quite similar male terminalia. Consequently there appears to be no other alternative than to consider *incognita* and *polystigma* as distinct species, even though they occur side by side in the same locality. The entire series of both species were critically examined for intergrading color variations in the diagnostic characters, and none were found.

*Cyrtoneurina trita* (Stein)

*Mydaea trita* STEIN, 1911, Arch. Naturgesch., div. A, vol. 77, p. 87.

*Cyrtoneurina trita* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 229.

*Cyrtoneuropsis trita* CURRAN, 1934, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 465.

MALE: Narrowest part of front about as wide as diameter of anterior ocellus, the parafrontals broadly contiguous and setulose along most of their length. Supraspiracular callosity pilose and the pleuratergite below calyptrae without setulae but with short pile. Wings with a small but distinct cloud at node and at upper anterobasal corner of discal cell, another cloud at stigma which is subconfluent with the cloud which extends along most of the length of second vein and which, in turn, is confluent with the one surrounding the anterior cross vein. Posterior cross vein also surrounded with a broad cloud.

Hind femora with two or three long, anteroventral bristles on apical one-third, basad, with a complete row of much shorter ones which are not quite so long as diameter of femora where situated; with about four to six similar bristles on basal one-half to two-fifths of posteroventral surface.

The female is very similar to the male, but the cloud along first vein is broadly interrupted, so that there is one spot confluent with stigmal and another at apex of second vein.

SPECIMENS EXAMINED: Panama Canal Zone: One male, one female, Balboa, June 12, 1943 (F. M. Snyder). Costa Rica: Male and one female, Higuito, San Mateo (Pablo Schild).

There is also a male from Itaquauecetuba, São Paulo, Brazil, November 19 (C. H. T. Townsend), in the United States National Museum collection which differs from the others in having the tibiae entirely brownish yellow and the cloud along first vein broadly interrupted as in the female. The posteroventral bristles on hind femora are more numerous and closely placed. The parafrontals are also somewhat wider; and in profile, both the parafacials and parafrontals are distinctly visible. Until more material is available, these differences are merely noted.

In the description of this species, Stein mentions the clay yellow color of the anten-

nae and aristae as well as the presence of two anterodorsal and anteroventral bristles on the hind tibiae. In the specimens before me, the first, second, and base of third antennal segments are fulvous, and the last-named is darker brown on most of the apical half. The male possesses a single anteroventral median bristle on hind tibiae. Since the wing markings, male front, and the bristling of the hind femora agree so well with Stein's description, I am following Curran (1934a) in using the name *trita* for those specimens possessing a clump of setulae on the stem vein opposite its juncture with the humeral cross vein, and a bare prosternum and propleura.

Dr. Hennig informs me that there is a male from "Paraguay, Fiebrig" in the zoological collection of the University of Berlin which bears a handwritten label "*Cyrtoneurina trita* Stein type" in Stein's handwriting and a red type label. This specimen is not conspecific with the five enumerated above, but I doubt if it can be the type of *trita*, because Stein described this species from a pair from San Carlos, Bolivia. Dr. Hennig's notes on this specimen would indicate that it is quite close to, if not identical with, *polystigma*.

If I have incorrectly identified *trita*, the specimens from Balboa and Higuato are undoubtedly a new species, and the true *trita* will probably trace to *polystigma* in my key and could be separated from it by having two anterodorsal bristles on the hind tibiae and in the male by possessing distinct posteroventral setulae on the hind femora.

***Cyrtoneurina dubia*, new species**

*Cyrtoneurina inuber* Giglio-Tos, CURRAN, 1934, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 464.

**MALE:** Length, 4.5 to 6.5 mm. Head black, grayish brown pruinose. Narrowest part of front about as wide as diameter of anterior ocellus. The parafrontals contiguous along most of their length. The anterior pair of parafrontal bristles long, equal in length to anterior ocellar bristles; with a pair of reclinate posterior parafrontals before the anterior ocellus. Parafacials and parafrontals obscured in profile. Cheeks as high as width of third antennal segment. Antennae yellow, inserted at a level slightly below middle of eyes; third segment 2.75 to 3.0 times as long

as second. Palpi yellow on apical three-fifths, darkened basally.

Thorax dark, grayish to yellowish gray pruinose, with a median brown vitta and narrower vittae on both sides of the dorso-central row of bristles. Humeri fulvous. The four postsutural pairs of dorsocentrals subequal. Pra as long as posterior notopleural bristle; with notopleural setulae adjacent to base of the latter. Propleura bare. Prosternum with a row of short lateral setulae. Preepisternum III with a few pale hairs. Supraspiracular callosity short pilose; the pleuratergite below calyptrae usually with several short setulae.

Legs infuscated except the fore and mid tibiae which are occasionally yellowish near base and become brownish apically. Mid femora with four or five ventral bristles on the basal one-half and a few shorter, basal anteroventrals. Hind femora with eight to 10 anteroventral bristles, those on basal one-half about as long as femoral diameter, while those on apical half become gradually longer apically; with a row of more widely separated bristles along entire length of posteroventral surface. Hind tibiae with one submedian anterodorsal and anteroventral bristle, and with a short, but distinct, posterodorsal on the basal one-half to two-fifths.

Wings yellowish hyaline, more intensively tinged along fore margin and with a slightly brownish stigmal spot. Anterior cross vein surrounded by a narrow cloud, with or without a very faint one surrounding posterior cross vein. Stem vein setulose on both surfaces basad of humeral cross vein. Calyptrae slightly yellowish hyaline. Halteres yellow.

Abdomen brownish fulvous basally, becoming darker apically, grayish pruinose. Clothing setulae inserted in small, dark, shiny spots. With a dark pre-apical band on first visible tergite and an apical one on the second and third tergites, when viewed laterally. Viewed from above and behind, with a pair of subtriangular, dark, basal spots on the second to fourth visible tergites inclusive. Basal sternite setulose.

**FEMALE:** Length, 5 to 6.75 mm. Similar to the male. Front at vertex 0.3 of head width, scarcely narrowed anteriorly. With a pair of cruciate interfrontal bristles and without setulae laterad of the usual row of long and

short parafrontal bristles. Mid tibiae brownish. The bristles on ventral surface of mid and hind femora shorter than femoral diameter except for the longer pre-apical antero-ventrals on hind femora.

Wings with costal margin, stigmatal spot, and the clouds surrounding cross veins darker and more prominent than in male, especially the cloud surrounding the posterior cross vein.

Base of abdomen not so fulvous as in male; the pre-apical and apical bands broader and the paired triangular spots are frequently fused on the fourth tergite.

TYPE MATERIAL: Holotype, male, Chanchamayo, "Dept." Junin, Peru, 1200 meters, August 9, 1948 (José M. Schunke); allotype, female, topotypical, 1100 meters, August 11, 1948 (J. M. Schunke); paratypes, two males, three females, topotypical, June 11, 27 and August 4; one male, Summit, Panama Canal Zone, July, 1946 (N. L. H. Krauss); two males, El Cermen, Panama, December-January, 1939-1940, fruit fly trap (Zetek No. 4621); one female, Cano Saddle, Gatun, Panama, April 27, 1924 (R. C. Shannon); one female, Las Cascadas, Canal Zone, on human "faeces" (A. H. Jennings); one female, Alhajuelo, April 17, 1912 (A. Busk); one female, La Chorrera, May 12, 1912 (A. Busk); one female, Cabima, May 25, 1911 (A. Busk); five males, 13 females, Barro Colorado Island, May 14, 1926 (C. T. Greene); one female, David, Panama, August 29, 1943 (F. M. Snyder); six males, 17 females, Higuito, Costa Rica (Pablo Schild); one male, six females, Quiriqua, Guatemala, May 7 (J. M. Aldrich); one male, two females, Escuintal, Guatemala, February 7, 1905 (Stella Deam); two females, Puerto Castilla, Honduras, May 6, 1926 (R. H. Painter); one male, near Para, Brazil (H. B. Merrill); two males, one female, Isla Marajo, Amazonas, mouth of Rio Amazon, Brazil; one male, Tukeit, British Guiana, July 21, 1911.

The Peruvian specimens are somewhat darker than the paratypes from Central America; the thoracic pruinescence of the latter are more yellowish, the brown vittae are frequently narrower, and the clouds surrounding the posterior cross vein are less distinct, particularly in females.

If specimens have the prosternum obscured

and it is assumed that they lack prosternal hairs, then *dubia* will trace to *rescita* Walker and they can be separated from that species by the following couplet:

Third antennal segment mostly yellow to fulvous; at least apices of palpi fulvous. *Males*: Parafrontals broadly contiguous . . . . .

. . . . . *dubia*, new species  
Third antennal segment with only a faint brownish to reddish basal area; palpi entirely infuscated. *Males*: Parafrontals separated by a distance at least as great as diameter of anterior ocellus . . . . . *rescita* (Walker)

#### *Cyrtoneurina gemina* (Wiedemann)

*Anthomyia gemina* WIEDEMANN, 1830, *Ausereuropäischen zweiflügeligen Insekten*, vol. 2, p. 436.

*Spilogaster gemina* STEIN, 1902, *Zeitschr. Syst. Hymenopterologie u. Dipterologie*, vol. 2, p. 130; 1904, *Ann. Hist. Nat. Mus. Natl. Hungarici*, vol. 2, p. 436.

*Cyrtoneurina gemina* STEIN, 1918, *Ann. Hist. Nat. Mus. Natl. Hungarici*, vol. 16, p. 222. MALLOCH, 1925, *Ann. Mag. Nat. Hist.*, ser. 9, vol. 16, p. 90. CURRAN, 1934, *Bull. Amer. Mus. Nat. Hist.*, vol. 66, p. 464.

? *Mydaea immunda* STEIN, 1911, *Arch. Naturgesch.*, div. A, vol. 77, p. 90.

? *Cyrtoneurina immunda* STEIN, 1918, *Ann. Hist. Nat. Mus. Natl. Hungarici*, vol. 16, p. 230.

The antennae are pale yellow to fulvous, and the palpi are somewhat lighter colored apically. In males, each parafrontal at its narrowest part is as wide as diameter of the anterior ocellus and the parafrontals may be broadly contiguous or narrowly separated along their entire length.

The thoracic pruinescence varies from brownish yellow to yellowish gray. The first pair of postsutural dorsocentrals are much shorter than the second pair, and both pairs are conspicuously shorter than the posterior two pairs. Prosternum and pre-episternum III setulose; the supraspiracular callosity and the pleuratergite below calyptrae lack setulae. The flap-like covering of hairs of posterior thoracic spiracle lack accessory setulae.

The tibiae vary from dark brown to fulvous, though the anterior pair are usually fulvous on the basal one-half. Both sexes have a single strong and frequently one or two finer anteroventral bristles on apical one-fourth to one-third of hind femora. Hind



tibiae with a strong median anterodorsal and a weaker posterodorsal bristle; the posterodorsal clothing setulae on apical one-half to one-third are sometimes slightly upright and prominent. The number of anteroventral bristles are variable; in males, these vary from two to five, and in females from none to two. Both sexes possess at least one strong ventral bristle at base of mid femora.

Wings unclouded, or with at most an extremely faint darker tinge at stigma. Apical margin of male calyptrae dark.

Originally described from Brazil and subsequently recorded from Colombia and Costa Rica by Stein, from Trinidad and Panama by Malloch, and from British Guiana by Curran.

**SPECIMENS EXAMINED:** More than 650 specimens of both sexes were studied from Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Venezuela, Trinidad, Grenada, Brazil, and Peru.

This is the species identified as *gemina* by Malloch (1925) and Curran (1934a). I have considered *immunda* Stein to be a synonym for the following reasons. In 1902 Stein presented notes on Wiedemann's type, and in 1904 he again redescribed *gemina*, but it is not clear whether the latter description was based on the type of *gemina* or on specimens from Panama and Colombia which he had before him at that time. The relative size of the postsutural dorsocentral bristles is not mentioned in either of Stein's descriptions of *gemina*. In 1911 he described *immunda* and noted the short anterior pair of postsutural dorsocentrals and added that it was closely allied to *gemina*, but the latter species was not included in his key. In the same paper he described *seriata* and indicated that it might be a variety of *gemina*. Specimens that I have identified as *seriata* have the anterior postsutural pair of dorsocentrals very short. In 1918 *gemina* and *immunda* were keyed by Stein, and the only character used to separate the two was the difference in distance between the eyes in the males of the two species. I have, consequently, assumed that the dorsocentral character is the same in the two species. Dr. Willi Hennig graciously examined the female cotype of *immunda* and informs me that it possesses prosternal hairs, which would indicate its

close relationship to *gemina* as herein treated.

In the series of male specimens before me, a considerable variation in front width is found; some have the frontal vitta obscured and others have it distinct, though narrow, and there are all gradations between. I have therefore considered *immunda* to be the form with the wider front.

#### *Cyrtoneurina armipes* (Stein)

*Mydaea armipes* STEIN, 1911, Arch. Naturgesch., div. A, vol. 77, p. 88.

*Cyrtoneurina armipes* CURRAN, 1934, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 464.

Similar in general habitus to *gemina*. The thoracic dorsum is grayish and prominently vittate in both sexes. Presuturally, two of the vittae lie between the planes of the dorsocentral row of bristles and are distinctly convergent posteriorly, where they are fused at about the transverse suture and extend posteriorly as a median brown stripe to the middle of the scutellum. Laterad to the dorsocentral row of bristles there is a broad brownish vitta which extends from the inner border of the humeri to the postsutural intra-alar bristle. The postsutural dorsocentral bristles arise from subconfluent brown spots. When viewed posterolaterally, there is a narrow brown vitta along the lateral edge of the notopleura which extends posterolaterally from the transverse suture to base of the supralar callosity, through the bases of the supralar series of bristles. The anterior two postsutural pairs of dorsocentrals very short. Pre-episternum III setulose; supraspiracular callosity short pilose; pleuratergite below calyptrae bare. Hypopleura with one or two long setulae anteriorly. Posterior spiracle without accessory setulae among the flap-like covering of hairs.

Wings with a faint stigmal cloud, another cloud extending along most of the apical portion of the second vein, and with a faint shadow surrounding the anterior cross vein. Stem vein bare. Calyptrae white, the apical region darkened in males. Halteres yellow.

Mid femora with a short, but stout, ventral bristle on basal one-third in males; absent or scarcely differentiated from clothing hairs in female. Hind femora with one pre-apical anteroventral bristle and one or

two much shorter ones basad and apicad; posteroventrally without bristles or setulae. Hind tibiae in male with one median antero-dorsal, five to eight long anteroventrals on apical one-third to one-half, and a single long and very strong ventral to somewhat posteroventral bristle at middle or slightly beyond; the posterodorsal surface with a short median bristle, the setulae beyond somewhat upright and longer than the other clothing setulae. Hind tibiae of female without ventral bristles and only three or four short anteroventrals.

Originally described from Peru.

**SPECIMENS EXAMINED:** Panama: One female, Trinidad River, June 7, 1912 (A. Busk). British Guiana: Two males, Bartica District, April 23, 1924; three females, upper Essequibo River, December 23, 1931 (W. G. Hassler); one male, one female, Arakaka, Northwest District, August 2 to 4, 1934 (F. A. Squire). Brazil: One male, Carvoeiro, Rio Negro-Rio Branca, Amazonas, August 27, 1924.

There are two other species which have a characteristic strong ventral to posteroventral submedian bristle on the hind tibiae in the male. One of these (*nearmipes*) has a dark stigmal spot as mentioned in the description of *armipes* by Stein. As it lacks setulae on the first wing vein, it is unlikely that it could be *armipes*, because Stein included *armipes* in the portion of his key having the first vein setulose. In 1918 Stein recorded *armipes* from Mexico, but noted that the wings were entirely hyaline. He suggested that these Mexican specimens were at most a variety of *armipes*, but I suspect that they are distinct and are the species that is described as *steini*, new species, below.

***Cyrtoneurina steini*, new species**

*Clinopera uber* Giglio-Tos, VAN DER WULP, 1896, Biologia Centrali-Americana, vol. 2, p. 307 (in part).

*Cyrtoneurina armipes* Stein, STEIN, 1918 (not 1911), Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 222.

**MALE:** Length, 5.5 to 6.75 mm. Similar to that of *armipes* Stein in color, thoracic markings, and general habitus, but differs from it in having the prosternum bare, the anterior two pairs of postsutural dorsocentral bristles

almost as long as the posterior two pairs, and in having the unclouded wings slightly tinged with yellow. Mid femora usually with two ventral bristles. The stem vein is entirely bare in both species. The thoracic vittae are sometimes not quite so prominent as in *armipes*, though they are always distinct.

**FEMALE:** Length, 5.5 to 6.75 mm. Similar to the male. Front at vertex 0.26 to 0.30 of head width, slightly widened anteriorly. With a narrow brownish pruinulent triangle extending to base of antennae along the frontal vitta. Hind tibiae without the characteristic median ventral bristle.

**TYPE MATERIAL:** Holotype, male, Tapachula, Mexico, August 17, 1943 (F. M. Snyder); allotype, female, same data as holotype; paratypes, 23 males and 18 females, same data as holotype.

**ADDITIONAL RECORDS:** Seventy-two specimens of both sexes from Mexico: Teapa, Tabasco; Medellin and Atoyac, Veracruz; Chichen Itza, Yucatan. Guatemala: San Jeronimo; Moca Such; La Providencia, Obispo; Quirequa; Ayutla; Taman. El Salvador: San Salvador. Honduras: Corodito; Prieta, Panama Republic: Argas. Colombia: Hacienda Garcia, Cuaca Valley.

The four species *steini*, *armipes*, *gemina*, and *seriata* have very similar, if not identical, male as well as female terminalia. Both sexes of *steini* are readily distinguished from the others by lacking prosternal setulae. Males of *steini* and *armipes* differ from the others in having a strong median ventral bristle on the hind tibiae. If the prosternum is obscured, the only satisfactory way to separate *steini* from *armipes* is by the presence of a distinct stigmal spot in *armipes* and by its absence in *steini*, and by the more northern distribution of the latter.

If females have the prosternum obscured, the four species are best separated by the postsutural dorsocentral bristle character. In *armipes* the anterior two pairs are very short and subequal; in *steini* all four pairs are long; in *gemina* and *seriata* the anterior pair is very short, but the second pair is proportionally longer in *seriata* than in *gemina*. However, the best character to separate these last two species is the presence of a stigmal spot in *seriata* and its absence in *gemina*.

*Cyrtoneurina seriata* (Stein)

*Mydaea seriata* STEIN, 1911, Arch. Naturgesch., div. A, vol. 77, p. 91.

*Cyrtoneurina gemina* var. *seriata* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 230.

*Cyrtoneurina seriata* MALLOCH, 1925, Ann. Mag. Nat. Hist., ser. 9, vol. 16, p. 90.

Similar in most respects to *gemina* Wiedemann, except the bristling of hind legs of males as noted in the key. In addition, the anteroventral row on the hind tibiae is somewhat more anteriorly situated than in *gemina*. (See also notes under the preceding species.)

Originally described from Peru and recorded from Brazil by Malloch.

SPECIMENS EXAMINED: Brazil: One female, Para, April, 1930 (N. C. Davis), in the United States National Museum; one female, Para, June 6, 1899 (Churchill); one male, two females, Mosqueiro, Rio de Para, March 12, 1896 (E. E. Austen), in the British Museum (Natural History); one male, Pernambuco, October 3, 1935 (Tapera), in the American Museum of Natural History; one male, Urururytuba, Tapajos River, April 8 (C. H. T. Townsend), in the United States National Museum.

*Cyrtoneurina fuscicosta* (Curran)

*Cyrtoneuropsis veniseta* Stein, MALLOCH, 1925, Ann. Mag. Nat. Hist., ser. 9, vol. 16, p. 91.

*Cyrtoneuropsis fuscicosta* CURRAN, 1934, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 466.

The characteristic broad, interrupted, dark cloud along the fore margin of the wing, coupled with the very weak anterior pair of postsutural dorsocentral bristles followed by three very much stronger pairs, readily distinguishes this species from any other *Cyrtoneurina* known to me.

The supraspiracular callosity has short hairs, but neither it nor pleuratergite below calyptrae has distinct setulae. Pre-episternum III setulose, and notopleura with setulae adjacent to base of anterior bristle only.

The description of the leg bristles in the original description is somewhat confusing because of a typographical error. The mid femora have one to three stout ventral bristles. Mid tibiae with two median posterior bristles. Hind femora have three pre-apical anteroventral bristles, the median one strong-

est. Hind tibiae with one median antero-dorsal, one to three submedian anteroventral, a weak but distinct posterodorsal bristle on basal one-half to one-third; the posterodorsal setulae on basal one-half short but distinct.

This is the species identified as *Cyrtoneurina veniseta* (Stein) by Malloch when he described *Cyrtoneuropsis* and designated *veniseta* Stein as genotype. If the genotype is to be considered as being represented by the specimens of the species that the author of a new genus had at hand when designating the species of another author as genotype, then *fuscicosta* Curran and not the true *veniseta* Stein should be considered to be the genotype of *Cyrtoneuropsis* Malloch.

SPECIMENS EXAMINED: British Guiana: One male, Kartoba, May 8, the holotype; one female, October 17, the allotype; one female, Chenapowu, July 31, 1911; one female, Kangaruma, July 13, 1911; one female, Schudihar River, December 29, 1937 (W. G. Hassler); one male, Wismar, May 9, 1936; all in the American Museum of Natural History. One male, Takaruni River, Section 2 (Cattle Trail Survey), June, 1919 (A. A. Abrahams), determined as *veniseta* Stein by Malloch, in the British Museum (Natural History). Brazil: One female, Manãs, Amazonia, June, 1931 (R. C. Shannon), in the United States National Museum.

*Cyrtoneurina conspersa* (Stein)

*Mydaea conspersa* STEIN, 1911, Archiv. Naturgesch., div. A, vol. 77, p. 89.

*Cyrtoneurina conspersa* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 229. MALLOCH, 1925, Ann. Mag. Nat. Hist., ser. 9, vol. 16, p. 91.

*Cyrtoneurina diagramma* van der Wulp, CURRAN, 1934, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 464.

A robust, densely golden pruinose species. Antennae and apical one-half or more of the palpi yellow in males; more fulvous in females.

Pre-episternum III, supraspiracular callosity, and pleuratergite below calyptrae not setulose, though the supraspiracular callosity has short pile. Females have the pra somewhat more well differentiated than in most species lacking cruciate interfrontal bristles. The anterior two pairs of postsutural dorso-

central bristles shorter and weaker than the posterior two pairs. The posterior thoracic spiracle without accessory setulae among the flap-like covering of hairs.

Legs dark brown, the fore and mid tibiae rather yellowish fulvous. Mid femora in males with a row of short anteroventral bristles on the basal one-half and with two or three strong ventral bristles on the basal one-fourth; in females only the ventral bristles on mid femora are distinct. Hind femora in both sexes with one strong and two or three shorter and weaker anteroventral bristles on apical one-fourth. Hind tibiae of males with one or two strong and several weaker anterodorsal bristles and four to six well-developed anteroventrals on apical one-half and with about six shorter posterior to posteroventrals at middle; in females with two to four distinct anterodorsals and one or two anteroventrals, the posterodorsal row of clothing setulae longer and more upright than usual.

Originally described from Peru; Malloch (1925) and Curran (1934a) recorded it from British Guiana.

**SPECIMENS EXAMINED:** British Guiana: Two male, Tukiet, July 27, 1911; two females, Kartabo, Bartica District, 1921, in the American Museum of Natural History; one female, Ituni Savannah (Cattle Trail Survey), May, 1919 (A. A. Abraham), in the British Museum (Natural History). Peru: One female, Iquitos; two females, Rio Morona, August 20, 1923; one female, middle Rio Ucayali, November 22, 1923 (all Harvey Bassler), in the American Museum of Natural History. Brazil: One female, Alcohaca River, Tocantins, Para, December, 1926 (E. G. Holt), in the United States National Museum.

*Cyrtoneurina maculipennis* (Walker)

*Anthomyia maculipennis* WALKER, 1856, Insecta Saundersiana, vol. 1, p. 357.

*Spilogaster maculipennis* STEIN, 1901, Zeitschr. Syst. Hymenopterologie u. Dipterologie, vol. 1, p. 201; 1904, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 2, p. 431.

*Cyrtoneurina maculipennis* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 225.

Similar to *gluta* Giglio-Tos in having the same bare or setulose portions of thoracic pleura. This species and *maculipennis* Walker

are the only ones in the genus which have a median posterior bristle on the fore tibiae, and except for *spiloptera* Wiedemann are the only ones with three pairs of postsutural dorsocentral bristles.

The unspotted wings will readily separate *gluta* from *maculipennis*. In addition, the basal one or two visible abdominal tergites in both sexes of *maculipennis* are more translucent yellow to fulvous than in *gluta*, and females of the former species frequently have partly or entirely fulvous humeri. In *maculipennis* females, the calyptae are more yellow tinged, but males of both species have the apical margin of the lower ones infuscated.

**SPECIMENS EXAMINED:** In addition to the single female type from Brazil, in the British Museum (Natural History), I have studied 23 specimens of both sexes from Brazil: Itaquaquecetuba, São Paulo, and Rio de Janeiro.

*Cyrtoneurina gluta* Giglio-Tos

*Cyrtoneurina gluta* GIGLIO-TOS, 1893, Boll. Mus. Zool. Anat. Univ. Torino, vol. 8, no. 147, p. 6; 1894, Mem. R. Accad. Sci. Torino, ser. 2, vol. 14, p. 15.

*Clinopera uber* Giglio-Tos, VAN DER WULP, 1896, Biologia Centrali-Americana, vol. 2, p. 307 (in part).

*Cyrtoneurina limbisquama* STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 225.

A dark species which has a variable basal portion of the tibiae and second and third antennal segments brownish to fulvous. In males, the basolateral portion of the first two visible abdominal tergites is fulvous to yellow; in females, it is mostly or entirely infuscated. The wings are hyaline or with a very faint brownish tinge, and the anterior cross vein may or may not be surrounded by a very faint, narrow, brown cloud. The large lower calyptae are entirely white in females, but in males these are broadly bordered with brown or black. Halteres yellow.

Pre-episternum III has distinct setulae, and the small posterior thoracic spiracle lacks accessory setulae among the flap-like covering of hairs.

Hind femora have one to three anteroventral bristles on the apical one-fourth to one-third, and the other ventral surfaces are bare. Hind tibiae with one anterodorsal and one or two median anteroventral bristles.

**SPECIMENS EXAMINED:** Thirty of each sex from: Mexico: Teapa, Tabasco [determined as *uber* Giglio-Tos by van der Wulp, in the British Museum (Natural History)]. Guatemala: La Providencia; Livingston. British Honduras (no other data). Costa Rica: San José; Higuaita, San Mateo. Panama Republic: Porto Bello. Canal Zone: Frijoles; Tabernilla. Venezuela: Caracas.

The one male and one female specimen from Tuxpango (Sumichrast) mentioned by Giglio-Tos (1894) are in the University of Turin collection, and the male specimen is hereby designated as the lectotype. The female specimen is not conspecific with the lectotype but is *Cyrtoneurina rescita* (Walker).

There is another female in the Bellardi collection at Turin labeled "*Cyrtoneurina* ♀ *gluta*? G.T." This specimen is conspecific with the lectotype, but, in discussing this species in 1894, Giglio-Tos mentioned the difference in wing marking of the two sexes. It is obvious, therefore, that the above specimen was not the female he had when he discussed it in 1894 and that the specimen of *rescita* in the collection probably represents his concept of the female of *gluta*.

***Cyrtoneurina continens*, new species**

**MALE:** Length, 7 mm. Head yellowish brown, grayish pruinulent. Back of head infuscated from vertex to opposite ventral level of eyes and dorsal region of cheeks. The front at narrowest part is slightly wider than diameter of anterior ocellus. The parafrontals contiguous on the dorsal one-third. With a pair of moderately strong, anterior, parafrontal bristles and with numerous very short hairs extending to ocellar triangle; the posterior pair of these hairs somewhat strong, reclinate, and almost as large as the rather weak anterior ocellar bristles. In profile, the juncture of parafacials and parafrontals is scarcely visible. Cheeks about 1.2 times as high as greatest width of third antennal segment. Antennae, including arista, fulvous yellow, apical portion of third antennal segment with somewhat darkened areas. In profile, antennae are inserted at a level very slightly below middle of eyes and extend to slightly below their lower margin. The third antennal segment is 2.6 times as long as second. Longest arisal hairs 0.66 the length

of third antennal segment. Palpi yellow, not noticeably broadened apically.

Thorax brownish, a very limited apical portion of the scutellum fulvous, and the humeri somewhat more yellowish brown than remainder of thorax. Thoracic dorsum grayish pruinulent, with five dark, subshiny, but rather indistinct vittae. Dorsocentrals 2:4 (broken off and obscured by pin in the single male; in female the anterior two pairs are very short, the third pair somewhat longer but shorter than the well-developed posterior pair). Pra 0.66 to 0.75 as long as posterior notopleural bristle; notopleura with numerous setulae adjacent to base of both bristles. Sides of scutellum with several irregular rows of setulae which are continued onto the ventral surface. Hypopleura entirely bare. Supraspiracular callosity pilose, the pleuratergite below calyptrae with numerous fine hairs. Anterior and posterior spiracles subequal; the flap-like covering of hairs yellow; neither with interspersed accessory setulae. Prosternum with numerous long lateral setulae. Propleura bare.

Legs yellowish except the fore femora which are indistinctly brownish and the fourth and fifth tarsal segments of all legs which are dorsally infuscated. Mid femora without bristles except for the three preapicals on the dorsal to posterior surfaces. Hind femora with three or four short but distinct anteroventral bristles on the apical one-fourth and with numerous long, fine, hair-like posteroventral bristles which become longer and stronger apically. Hind tibiae with two median anterodorsal and anteroventral bristles.

Wings faintly brownish hyaline, slightly yellowish along costal margin. Only the anterior cross vein surrounded by a dark cloud. Stem vein with numerous dorsal setulae basad of the humeral cross vein and with scars of one or two setulae on the ventral surface. First vein entirely bare. Third vein setulose on node and for about one-third of the distance to anterior cross vein on both surfaces. Fourth vein very strongly curved forward apically as in *Neomuscina*. Calyptrae more brownish hyaline than wings, their margins dark brown. Halteres yellow.

Abdomen brownish, densely grayish pruinulent. The clothing setulae inserted in

small, shiny, brown spots. First and second visible tergites with a very indistinct median vitta. When viewed laterally, all tergites with distinct dark reflections. Basal sternite setulose; the fifth with a shallow U- to V-shaped incision and with two to four distinct bristles on each lateral process.

**FEMALE:** Length, 8 to 8.5 mm. Similar to the male. Front parallel sided, not quite so wide as greatest width of one eye. With three or four pairs of cruciate parafrontal bristles in addition to the two pairs of outwardly and backwardly directed posterior parafrontals, and with numerous short, hair-like setulae laterad to all of them; without a pair of cruciate interfrontal bristles. Each parafrontal slightly narrower than the frontal vitta. The latter with a long, narrow, somewhat indistinct, subshiny triangle which reaches almost to base of antennae. Palpi, especially on apical one-half, distinctly broader than in male.

Hind femora without posteroventral hairs, or with only short ones which are confined to the base.

Calyptrae less brownish, and only the margin of the upper ones narrowly infuscated.

**TYPE MATERIAL:** Holotype, male, São Paulo, Brazil, 1941 (H. L. Parker); allotype, female, Itaquaquecetuba, São Paulo, Brazil, April 5 (C. H. Townsend); both in the United States National Museum; paratypes, two females, Chaco, Argentina (E. del Ponte).

#### ADDITIONAL NOTES

The following species, not mentioned in the above pages, were included in *Cyrtoneurina* by Stein (1918, 1919) and Séguy (1937).

*Clinopera dorsilinea* van der Wulp (1896, p. 308). Stein (1919, p. 127) included this species in *Cyrtoneurina*. The cotypes of *dorsilinea* are very similar to, if not identical with, cotypes of *Muscina aurantiaca* Hough (1900, p. 25).

*Anthomyia grisea* Wiedemann (1830, p. 422). Wiedemann's original description and Stein's (1902, p. 131) notes on the type, would indicate that this species probably belongs to *Cyrtoneurina* and is close to *polystigma* van der Wulp or one of the closely related species. Neither description is detailed enough for me to identify it or to include it in the key.

*Cyrtoneurina inflexa* Stein (1918, p. 224). This species belongs to *Neomuscina*, if I have correctly identified it (Snyder, 1949b, p. 18).

*Cyrtoneurina pallipes* Stein (1918, p. 228). According to the original description, this species has the fourth wing vein setulose and strongly curved forward. I do not know of any species with setulae on this vein. If a *lapsus* or a typographical error occurred and the third and not the fourth wing vein is setulose, *pallipes* may belong to *Neomuscina* (*Spiloptyromyia*) or *Cyrtoneurina*; if to the latter genus, then *continens*, new species, may be closely allied or identical with it.

*Cyrtoneurina scutellaris* (Fabricius), Stein (1918, p. 228). Examination of the specimen noted by Stein will be necessary before this species can be identified with certainty. It may belong to *Neomuscina* (*Spiloptyromyia*).

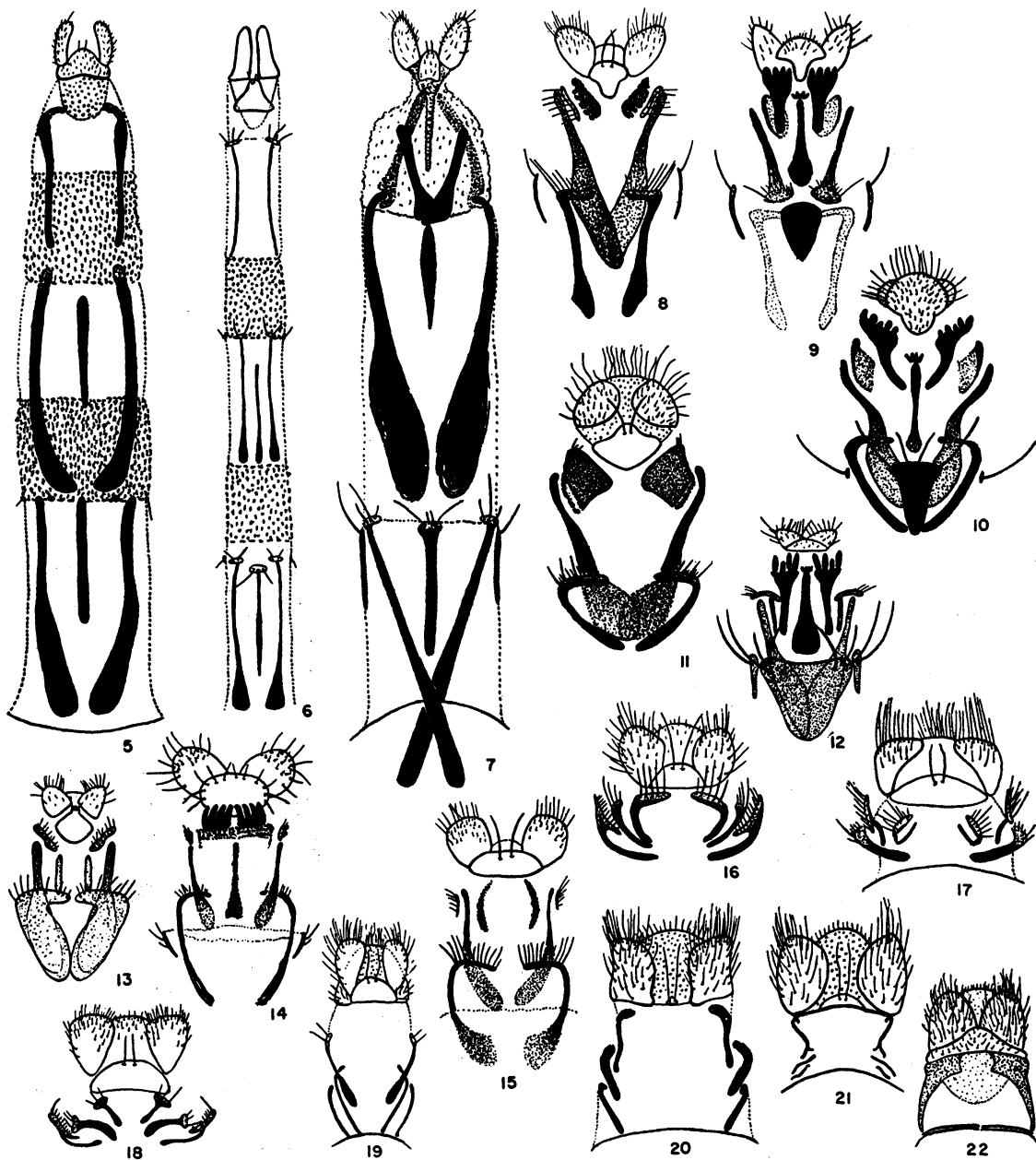
*Mydaea stabilis* Stein (1911, p. 86). Stein's description of this species and the position in which it was placed in his key to *Cyrtoneurina* (1918, p. 229) indicate that it probably belongs to *Neomuscina*, *sensu stricto*. See also Snyder (1949b, p. 32).

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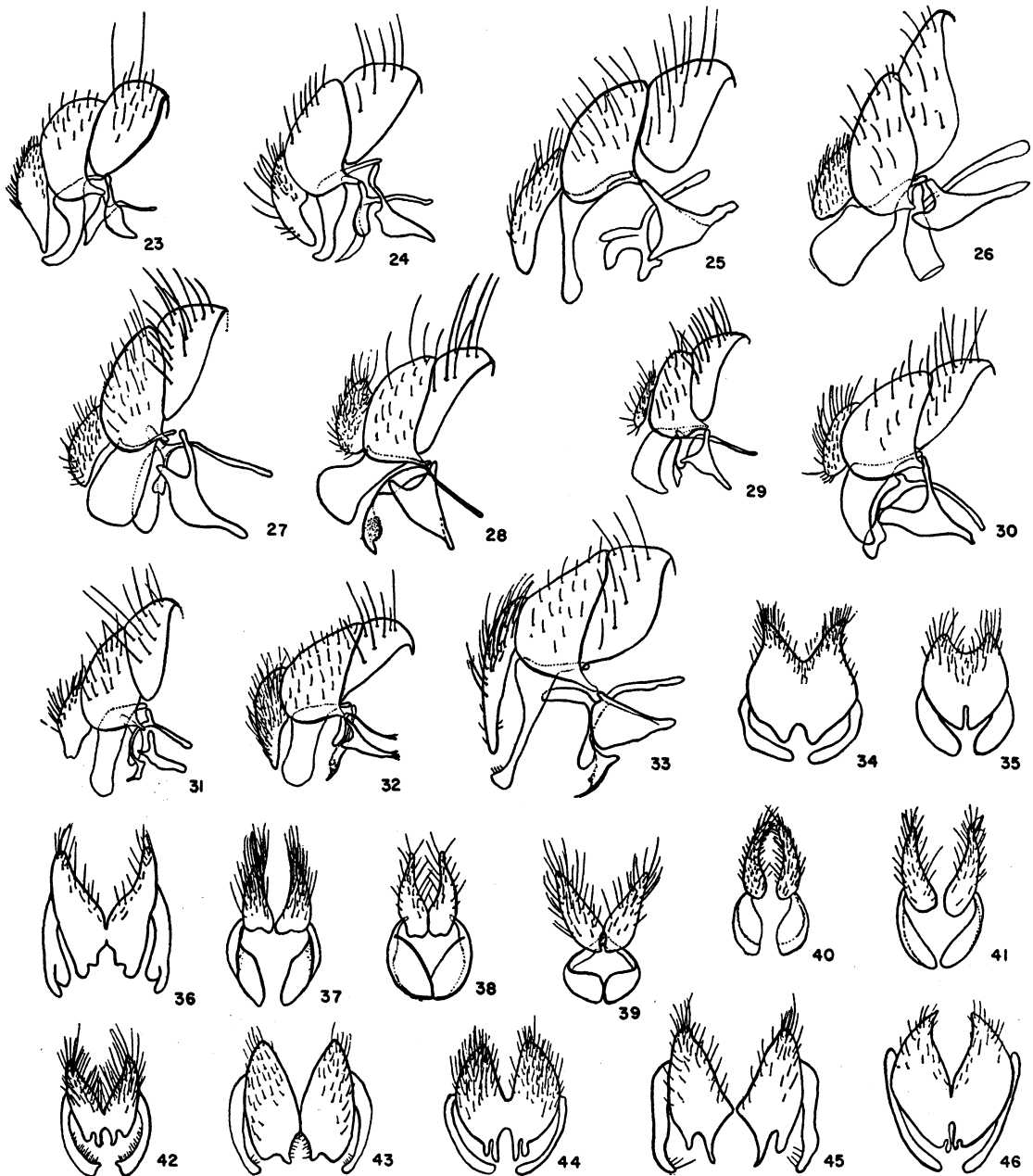
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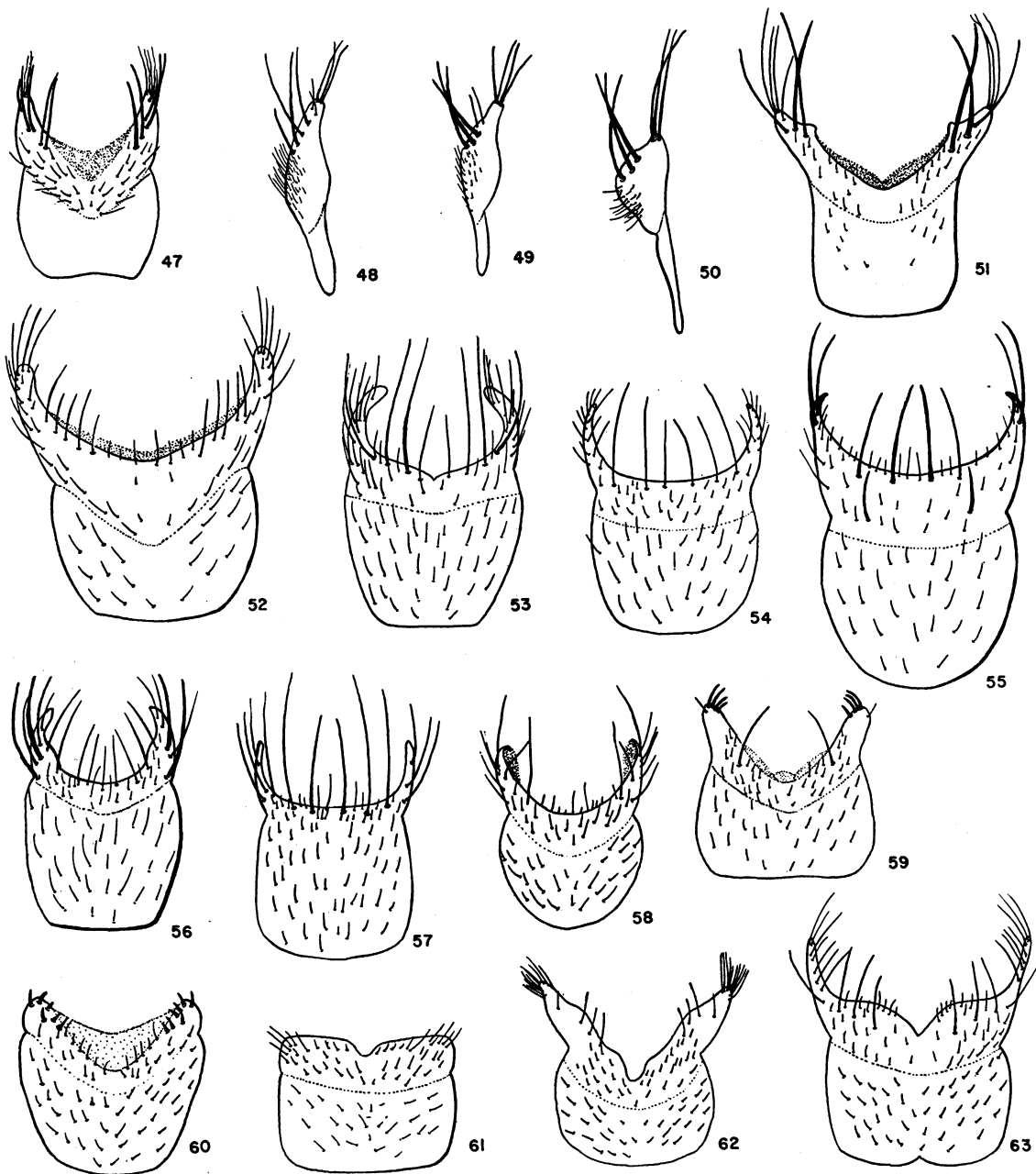


FIGS. 5-22. Ovipositor of *Cyrtoneurina*. 5. *C. uber* Giglio-Tos, dorsal view. 6. *C. geminata* (Stein), dorsal view (similar to that of *crispaseta*, new species, of *nearmipes*, new species, and of *biseta*, new species). 7. *C. inuber* Giglio-Tos, dorsal view (similar to that of *mellina* Stein and of *veniseta* Stein). 8. *C. praenubila*, new species, dorsal view. 9. *C. praenubila*, new species, ventral view (similar to that of *beebei* Curan, of *neotrita*, new species, and of *multomaculata* Stein). 10. *C. spilopectera* (Weismann), ventral view. 11. *C. spilopectera* (Wiedemann), dorsal view. 12. *C. rescita* (Walker), ventral view. 13. *C. rescita* (Walker), dorsal view. 14. *C. wulpi*, new species, ventral view (similar to that of *fuscisquama*, new species). 15. *C. wulpi*, new species, dorsal view (similar to that of *fuscisquama*, new species). 16. *C. polystigma* (Wulp), dorsal view. 17. *C. incognita*, new species, dorsal view. 18. *C. trita* (Stein), dorsal view. 19. *C. dubia*, new species, dorsal view. 20. *C. gemina* (Wiedemann), dorsal view (similar to that of *armipes* Stein, of *seriata* Stein, and of *steini*, new species). 21. *C. fuscicosta* (Curran), dorsal view (similar to that of *conspersa* Stein). 22. *C. maculipennis* (Walker), dorsal view (similar to that of *gluta* Giglio-Tos).



FIGS. 23-33. Lateral views of male terminalia of *Cyrtoneurina*. 23. *C. uber* Giglio-Tos (similar to those of *geminata* Stein, *biseta*, new species, and *nearmipes*, new species). 24. *C. crispaseta*, new species. 25. *C. mellina* Stein (similar to those of *veniseta* Stein, *inuber* Giglio-Tos, *gluta* Giglio-Tos, and *maculipennis* Walker). 26. *C. praenubila*, new species (similar to those of *neotrita*, new species, *fuscisquama*, new species, and *wulpi*, new species). 27. *C. beebei* (Curran) (similar to those of *protosetosa*, new species). 28. *C. spilopectera* (Wiedemann). 29. *C. rescita* (Walker) (similar to those of *polystigma* Wulp and *incognita*, new species). 30. *C. trita* (Stein). 31. *C. dubia*, new species. 32. *C. fuscicosta* (Curran). 33. *C. conspersa* (Stein) (similar to those of *armipes* Stein, *steini*, new species, *gemina* Wiedemann, and *seriata* Stein).

FIGS. 34-46. Dorsal or caudal views of superior and inferior male forceps of *Cyrtoneurina*. 34. *C. uber* Giglio-Tos (similar to those of *geminata* Stein, *nearmipes*, new species, and *biseta*, new species). 35. *C. crispaseta*, new species. 36. *C. mellina* Stein (similar to those of *veniseta* Stein and *inuber* Giglio-Tos). 37. *C. praenubila*, new species (similar to those of *neotrita*, new species). 38. *C. beebei* (Curran) (similar to those of *protosetosa*, new species). 39. *C. spilopectera* (Wiedemann). 40. *C. rescita* (Walker) (similar to those of *wulpi*, new species, and *fuscisquama*, new species). 41. *C. trita* (Stein). 42. *C. dubia*, new species. 43. *C. gemina* (Wiedemann) (similar to those of *armipes* Stein, *steini*, new species, and *seriata* Stein). 44. *C. fuscicosta* (Curran). 45. *C. conspersa* (Stein). 46. *C. maculipennis* (Walker) (similar to those of *gluta* Giglio-Tos).



FIGS. 47-63. Fifth sternite of male of *Cyrtoneurina*. 47. *C. uber* Giglio-Tos, ventral view. 48. *C. uber* Giglio-Tos, lateral view. 49. *C. geminata* (Stein), lateral view (similar to that of *biseta*, new species, and of *nearmipes*, new species). 50. *C. crispaseta*, new species, lateral view. 51. *C. crispaseta*, new species, ventral view. 52. *C. mellina* Stein, ventral view (similar to that of *veniseta* Stein and of *inuber* Giglio-Tos). 53. *C. praenubila*, new species, ventral view (similar to that of *neotrita*, new species). 54. *C. beebei* (Curran), ventral view (similar to that of *protosetosa*, new species). 55. *C. spiloptera* (Wiedemann), ventral view. 56. *C. rescita* (Walker), ventral view (similar to that of *polystigma* Wulp and of *incognita*, new species, *wulpi*, new species, and *fuscisquama*, new species). 57. *C. trita* (Stein), ventral view. 58. *C. dubia*, new species, ventral view. 59. *C. gemina* (Wiedemann), ventral view (similar to that of *armipes* Stein, of *steini*, new species, and of *seriata* Stein). 60. *C. fuscicosta* (Curran), ventral view. 61. *C. conspersa* (Stein), ventral view. 62. *C. gluta* Giglio-Tos, ventral view. 63. *C. maculipennis* (Walker), ventral view.







