

A REVISION OF THE NORTH AMERICAN TACHINID FLIES OF THE GENUS ACHAETONEURA

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The identification of certain species belonging to the genus *Achaetoneura* is extremely difficult and, in some cases, unless the specimen to be identified is accompanied by its puparium or host record, a positive determination is apparently next to impossible. Moreover, the species which compose the genus are very variable and, in two cases at least, are of a complex nature. Naturally, many variants are present, and it is believed that recognition of such forms as species has caused the confusion which exists throughout the group. This conclusion has been arrived at from the study of a large number of bred specimens at the Gipsy Moth Laboratory, the results of studies conducted by J. V. Schaffner, jr., and C. L. Griswold, and from material at the United States National Museum.

Since the species discussed are extremely liable to misidentification and because of the impracticability of their verification, previously published records as regards host and distribution have been, in most part, omitted from this revision. In another paper now in manuscript, this subject, particularly the host relations, will be fully considered.

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Genus ACHAETONEURA Brauer and Bergenstamm

Achaetoneura BRAUER and BERGENSTAMM, *Zweif. Kais. Mus. Wien*, vol. 5, p. 334, 1891.

Parafrontina BRAUER and BERGENSTAMM, *Zweif. Kais. Mus. Wien*, vol. 6, p. 115, 1893.

Rileyella TOWNSEND, *Ann. Ent. Soc. Amer.*, vol. 2, p. 249, 1909.

Ypophamyia TOWNSEND, *Ins. Ins. Mens.*, vol. 4, nos. 7-9, p. 75, 1916.

Masiceropsis TOWNSEND, *Ent. News*, vol. 27, no. 4, p. 178, 1916.

Brauer and Bergenstamm erected *Achaetoneura* for *hesperus*, new, but added several other species without distinctly designating one as type of the genus. Coquillett¹ designated *hesperus* as type. In his Revision of the North American Tachinidae (p. 105, 1897), Coquillett had included the North American species in *Frontina*, indicating as synonyms *Achaetoneura*, *Thysanomyia*, and *Parafrontina* of Brauer and Bergenstamm, and *Prosopaea* Rondani. In 1910, however (p. 545), he omitted *Thysanomyia* and *Prosopaea* from the synonymy of *Frontina*.

The type species of *Frontina* is *Tachina laeta* Meigen, by designation of Robineau-Desvoidy. This European species has strong discal bristles on the intermediate abdominal segments, the hind tibiae irregularly bristled, the third antennal joint peculiarly slender, and other characters foreign to *Achaetoneura*. Moreover, as Allen² has pointed out, *laeta* deposits microtype eggs on foilage, a reproductive habit distinctly different from that of *Achaetoneura*.

The conclusion accepted in the present paper is that *Frontina* in the proper sense does not occur in North America and that *Achaetoneura* is the oldest valid name to include our species. Except *Parafrontina*, the synonyms listed above are of more recent date than Coquillett's work.

Parafrontina, according to Townsend,³ has the eyes thickly pilose and could be excluded on this account; but there is evidently a mistake here, as the examination of the type series of the genotypic species *Parafrontina apicalis* Brauer and Bergenstamm shows the eyes to be bare. The species is exceedingly close to *Achaetoneura archippivora* Williston, and the genus is undoubtedly synonymous with *Achaetoneura*. *Rileyella*⁴ was proposed by Townsend for the reception of *Frontina aletiae* Riley,⁵ the sole character of the genus being the absence of median macrochaetae on the first and second abdominal segments above, either discal or marginal. This character alone can scarcely be considered of generic importance in this group any more than can the extremely variable characters which differentiate *Ypophamyia* Townsend,⁶ type *malacosomae* Townsend, from *Achaetoneura*. According to Townsend,⁷ *Masiceropsis* differs from *Ypophamyia* by broader front, longer antennae in female, no well-developed macrochaetae on first abdominal segment, apical cross-vein approximate to hind border of wing, hind cross vein farther from bend of fourth vein, and anal segment without

¹ Proc. U. S. Nat. Mus., vol. 37, p. 502, 1910.

² Trans. Amer. Ent. Soc., vol. 52, p. 187, 1926.

³ Bull. Amer. Mus. Nat. Hist., vol. 37, p. 232, 1917.

⁴ Ann. Ent. Soc. Amer., vol. 2, p. 249, 1909.

⁵ Canad. Ent., vol. 11, p. 162, 1879.

⁶ Ins. Ins. Mens., vol. 4, nos. 7-9, p. 75, 1916.

⁷ Idem, p. 76, 1916.

true discals, but with only submarginal or subdiscal macrochaetae. The type of *Masiceropsis* is *Masicera pauciseta* Coquillett, the type specimen of which is a female from California, a small fly with shrunken third antennal joint, parallel scutellar bristles, and weakly ciliated hind tibiae. It is accompanied by two males from the same locality (Los Angeles County) and all are undoubtedly the same species. This material, while not identical, is certainly inseparable generically from the *archippivora* complex on any stable characters.

The genera *Eucelatoria*, *Pseudomyothyria*, *Frontiniella*, *Ptychomyia*, *Prosopalaea*, and *Azygobothria* are all closely allied to *Achaetoneura* but distinct from that genus as here circumscribed.

Characters of Achaetoneura.—Eyes bare, at most with slight pubescence; facialia bristly at least one-half way; ocellar bristles present and directed forward, approximate at base and not especially divaricate; antennae reaching lowest fourth of face; third joint broad, rounded at apex, never tapering to a point; second joint usually short, sometimes elongate; frontal bristles extending below base of third antennal joint; front without evenly paired reclinate bristles outside of frontal row midway between lowest ocellus and base of antennae; arista bare; parafacials bare; face slightly receding; vibrassae at oral margin; bucca bristly; palpi yellow, well developed; proboscis short and fleshy. Thorax with well-developed bristles; four postsutural dorsocentrals, four sternopleurals; pteropleural bristle small; apical scutellar bristles present, usually erect and cruciate; abdomen pollinose, never with ventral carina, sharp piercer, or true discal macrochaetae; median marginal bristles present or absent on first and second segment. Hind tibiae evenly ciliate, with or without a longer bristle. Wing with normal venation, first posterior cell open, ending considerably before apex of wing; last section of fifth vein never one-half as long as preceding; veins bare excepting base of third.

Method of reproduction.—Practically all of the species deposit maggots which are ready to hatch, in choria on the body of the host, although, according to Allen,⁸ *aletiae* has developed the habit of subcutaneous larviposition.

Type of puparium.—So far as known, all of the species have smooth puparia, without spinelike hairs, and with the spiracular slits serpentine.

LIST OF HOST SPECIES

In citing the following host species, mention is made of only those whose record has been reviewed and the bred specimen examined.

⁸ Trans. Amer. Ent. Soc., vol. 52, p. 188, 1926.

Undoubtedly many of the other published records of host species are correctly referred to, but verification of them has not been obtained.

Achaetoneura frenchii (Williston).—*Callosamia promethea* Drury; *Ceratonia catalpae* Boisduval; *C. undulosa* Walker; *Datana anguisii* Grote and Robinson; *D. ministra* Drury; *D. integerrima* Grote and Robinson; *Diacrisia virginica* Fabricius; *Hyphantria cunea* Drury; *Malacosoma americana* Fabricius; *M. distria* Hübner; *Nygmia phacorrhoea* Donovan; *Paonias myops* Smith and Abbot; *Papilio polyxenes* Linnaeus; *P. troilus* Linnaeus; *P. turnus* Linnaeus; *Philosamia cynthia* Drury; *Pontia rapae* Linnaeus; *Porthetria dispar* Linnaeus; *Samia cecropia* Linnaeus; *Smerinthus geminatus* Say; *Sphinx chersis* Hübner; *S. kalmiae* Smith and Abbot; *Telea polyphemus* Drury; *Tropaea luna* Linnaeus; *Vanessa atalanta* Linnaeus.

Achaetoneura euchaetiae, new species.—*Euchaetias egle* Drury; *Halisidota tessellaris* Smith and Abbot.

Achaetoneura anisotae, new species.—*Anisota senatoria* Smith and Abbot; *A. rubicunda* Fabricius; *Diacrisia virginica* Fabricius.

Achaetoneura samiae, new species.—*Samia cecropia* Linnaeus; *Malacosoma americana* Fabricius.

Achaetoneura melalophae (Allen).—*Melalopha inclusa* Hübner.

Achaetoneura cuculliae, new species.—*Cucullia* sp.; *Dasylophia anguina* Smith and Abbot.

Achaetoneura dimmocki, new species.—(*Hyperchira*) *Automeris io* Fabricius.

Achaetoneura archippivora (Williston).—*Aglais milberti* Godart; *Alypia octomaculata* Fabricius; *Anosia plexippus* Linnaeus; *Euchaetias egle* Drury; *Euvanessa antiopa* Linnaeus; *Halisidota caryae* Harris; *Malacosoma americana* Fabricius; *Pontia rapae* Linnaeus; *Vanessa atalanta* Linnaeus.

Achaetoneura spectabilis (Aldrich).—*Tetralopha robustella* Zeller.

Achaetoneura testacea, new species.—*Pholus vitis* Linnaeus.

Achaetoneura aletiae (Riley).—*Alabama argillacea* Hübner; an arctiid; *Epargyreus tityrus* Fabricius; *Euvanessa antiopa* Linnaeus; *Halisidota tessellaris* Smith and Abbot; *Hemerocampa leucostigma* Smith and Abbot; *Hemileuca maia* Drury; *Hyphantria cunea* Drury; *Pholus* sp.; *Porthetria dispar* Linnaeus; *Stilpnotia salicis* Linnaeus.

Achaetoneura schizurae (Townsend).—*Schizura unicornis* Smith and Abbot.

Achaetoneura piperi (Townsend).—*Schizura ipomoeae* Doubleday.

Achaetoneura rileyi (Williston).—*Papilio thoas* Linnaeus.

Achaetoneura laniiferae, new species.—*Laniifera cyclades* Druce.

Achaetoneura pholi, new species.—*Pholus* species.

TABLE OF SPECIES

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| 1. First two segments of abdomen bearing median marginal bristles, those of the first segment often weak and hairlike but rarely absent..... | 2. |
| — First, or first and second segments of abdomen destitute of median marginal bristles..... | 14. |
| 2. Front at vertex in both sexes about equal to or less than eye width; arista thickened at base and tapering to apex; front pulvilli of male usually as long as or longer than last tarsal joint..... | 6. |
| — Front at vertex in both sexes well over the eye width..... | 3. |
| 3. Front at vertex less than one and one-half times the eye width; one row of bristles ascending the facial ridges..... | 4. |
| — Front at vertex nearly twice the eye width; two irregular rows of bristles ascending the facial ridges..... | 10. westonia, new species. |

4. Front, face, and post-orbital region cinereous, the former sometimes with golden tinge; bucca one-fifth the eye height.....5.
- Front, face, and post-orbital region golden pollinose; frontal vitta about one-fourth the frontal width; bucca one-eighth the eye height.
9. *texana*, new species.
5. Arista thickened from one-half to three-fourths way; front pulvilli of male less than length of last tarsal joint; abdomen black, usually thick gray pollinose with anal segment concolorous or golden pollinose; marginal bristles of second abdominal segment often weak.
8. *archippivora* (Williston).
- Arista thickened at base and gradually tapering to apex; front pulvilli of male longer than last tarsal joint; abdomen black, thinly gray pollinose, anal segment never golden; marginal bristles of second abdominal segment well developed.....4. *samiae*, new species.
6. Hind tibiae evenly ciliate with one longer bristle.....7.
- Hind tibiae evenly ciliate without a longer bristle; abdomen yellowish, thinly gray pollinose, median vitta absent or at most poorly defined.
17. *laniferæ*, new species.
7. Thorax and abdomen black, gray pollinose, the latter without a median vitta.....9.
- Thorax and abdomen or the abdomen alone otherwise colored.....8.
8. Abdomen brown or yellowish with a clearly defined median vitta; front pulvilli of male short.....18. *ferruginea* (Reinhardt).
- Head and body entirely golden pollinose; abdomen without clearly defined vitta; front pulvilli of male long.....19. *spectabilis* (Aldrich).
9. Mid-tibiae with one strong bristle on the outer front side near middle or with one strong and one weaker one above it, rarely with two equally strong and a weaker bristle above them, but if so, then the abdominal hairs are sub-erect at most.....10.
- Mid tibiae with three strong bristles on the outer front side near middle, if with only two strong and a weaker one above them, then a portion of the abdominal hairs along the dorsum are erect; forceps of male genitalia (viewed from behind) at widest part over one-fourth their length; front with several strong bristles outside of the frontal rows which are equal in strength to the latter.....7. *dimmocki*, new species.
10. Robust forms from 8-12 mm. in length; front in male usually over one-fourth head width.....11.
- Uniformly slender flies 5-8 mm. in length; front and face deeply golden pollinose; front narrow, in male about one-fourth and in female less than one-third head width; abdomen black, moderately yellowish gray pollinose.....5. *melalophae* Allen.
11. Front of male and usually that of female destitute of any strong bristles outside of the frontal rows; posterior spiracles of puparium not in a depression.....12.
- Front in both sexes with several strong bristles outside of the frontal rows; forceps of male genitalia viewed from behind, at widest part, more than one-third their length; front tarsi of female not noticeably enlarged; posterior spiracles or puparium in slight but well defined depression (if in male the front pulvilli are short, see *archippivora*).
4. *samiae*, new species.
12. Forceps viewed from behind, at their widest part, at least one-third their length; front tarsi of female not noticeably thickened.....13.

- Forceps viewed from behind, at their widest part, scarcely one-fourth their length; front tarsi of female noticeably thickened; posterior spiracles of puparium situated on longitudinal axis.....3. *anisotae*, new species.
13. Inner forceps of male genitalia, when viewed in profile, nearly straight or, at most, slightly bowed on their outer side, variable in length, form, and pigmentation; outer forceps slender. Sides of front in male moderately hairy, not thickly beset with minute hairs; posterior spiracles of puparium situated on longitudinal axis.
1. *frenchii* (Williston and complex).
- Inner forceps of male genitalia, when viewed in profile, distinctly bowed or straight for one-half their length and then inclined forward; outer forceps stout. Sides of front in male densely beset with minute black hairs; posterior spiracles of puparium situated above the longitudinal axis.....2. *euchaetiae*, new species.
14. First two segments of abdomen destitute of marginal bristles.....15.
- First segment of abdomen without, second segment with, marginal bristles.....19.
15. Hind tibiae evenly ciliate with one longer bristle.....17.
- Hind tibiae evenly ciliate without a longer bristle.....16.
16. Inner eye margins but slightly diverging below; face and front cinereous; abdomen brown or yellowish with a well-defined dorsal vitta.
16. *rileyi* (Williston).
- Inner eye margins widely diverging below; front and face golden pollinose; abdomen yellowish, thinly gray pollinose, without clearly defined vitta.....17. *laniferæ*, new species.
17. Head, thorax, and abdomen densely covered with golden pollen.
19. *spectabilis* (Aldrich).
- Head, thorax, and abdomen black, grayish pollinose, at most with sides of second and third segments reddish.....18.
18. Third antennal joint in both sexes at least three times the length of second; eyes distinctly pubescent under high magnification (if eyes are bare, front at widest part over eye width, see *archippivora* or *schizuræ*)12. *aletiae* (Riley).
- Third antennal joint in both sexes scarcely twice the length of second; eyes completely bare.....6. *cuculliae*, new species.
19. Hind tibiae evenly ciliate with one longer bristle.....22.
- Hind tibiae evenly ciliate without a longer bristle.....20.
20. Abdomen black, gray pollinose; third antennal joint in both sexes at least three times the second.....21.
- Abdomen brown or yellowish with a well-defined median vitta; third antennal joint in both sexes hardly twice the second; marginal bristles of the second abdominal segment weak or vestigial.
16. *rileyi* (Williston).
21. Median marginal bristles of second abdominal segment strong; hind tibiae densely ciliated; large form, 10-12 mm. in length.
15. *piperi* (Townsend).
- Median marginal bristles of second abdominal segment weak but constant in their appearance; hind tibiae moderately ciliated; medium sized forms 8-9 mm. in length. Thorax thickly gray pollinose with yellowish tinge (particularly noticeable when a series of specimens is observed); facial ridges usually bristly one-half way to antennae, sometimes a little less; front and face cinereous, the former with slight yellowish tinge, especially in female. This species is exceedingly close to *aletiae* but differs from

it in that the thorax is much more thickly gray pollinose, front and face never golden; abdomen black, lightly gray pollinose without brownish sides and bearing weak marginal bristles on second segment. Also the marginal bristles of the third segment are as long as or longer than are those of the fourth. If third antennal joint in either sex is less than three times second, see *cuculliae*-----13. *pholi*, new species.

22. Abdomen black, grayish pollinose-----24.
 — Abdomen brown or golden pollinose-----23.
23. Head, thorax, and abdomen densely covered with golden pollen.
 19. *spectabilis* (Aldrich).
 — Head and thorax black, grayish pollinose, abdomen brownish, destitute of golden pollen-----11. *testacea*, new species.
24. Third antennal joint, in either sex, three or more times the second-----25.
 — Third antennal joint scarcely twice the second; bucca one-eighth the eye height; small species measuring 6-8 mm. in length.
 6. *cuculliae*, new species.
25. Front at vertex in both sexes about or less than eye width; arista thickened at base and tapering to apex; front pulvilli of male at least as long as last tarsal joint-----26.
 — Front at vertex in both sexes well over the eye width; arista thickened from one-half to three-fourths way; front pulvilli of male less than length of last tarsal joint; abdomen usually thick gray pollinose.
 8. *archippivora* (Williston).
26. Large robust species, 10-12 mm. in length; hind tibiae of male densely ciliated without a longer bristle (in female, one longer bristle); fourth abdominal segment densely bristly except at extreme base, bristles nearest apex strongest; genitalia of male light brown or yellowish in most part, forceps when viewed from behind, at widest part, over one-half as wide as long and bearing at base of inner ones a conspicuous tuft of hairs; front of male moderately prominent, projecting a little over one-half eye width; facialia strongly bristly a little over one-half way; front pulvilli of male smoky black, nearly as long as the last two tarsal joints-----15. *piperi* (Townsend).
 — Medium sized species, 8 or 9 mm. in length, closely allied to *piperi* but differing from that species in its less robust form; less densely ciliated hind tibiae in male which bear one longer bristle; more sparsely bristled anal segment; genitalia appearing more slender, inner forceps bearing no conspicuous tuft of hairs; front less prominent; facialia weakly bristly one-half way; buccal area smaller; front pulvilli of male shorter and grayish rather than black-----14. *schizurae* (Townsend).

1. ACHAETONEURA FRENCHII (Williston)

Masicera frenchii WILLISTON, Scudder's Butterflies of New England, vol. 3, p. 1923, 1889.

Achactoneura hesperus BRAUER and BERGENSTAMM, Zweif. Kais. Mus. Wien, pt. 5, p. 334, 1891.

Masicera datanarum TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 287, 1892.

Frontina malacosomae CURRAN, Canad. Ent., vol. 57, p. 155, 1925.

Frontina sordida CURRAN, Trans. Roy. Soc. Canada, Sect. 5, p. 171, 1926, new name for *malacosomae* CURRAN, preoc.

Brauer and Bergenstamm described *hesperus* from some material sent them for determination by the United States Bureau of En-

tomology. They indicate no locality except North America, and returned no specimens labeled *hesperus*, although they marked several "Achaetoneura sp." One of these has been labeled by Townsend as probably *hesperus*. Apparently they did not label the types (they included more than one specimen, as in their part 6, 1893, p. 115, they say that the apical scutellars are "sometimes" erect), as it is understood that they did not retain any types. The specimen labeled by Townsend is undoubtedly *hesperus* Brauer and Bergenstamm and belongs to one of the varieties of the *frenchii* complex. Since *hesperus* is antedated by *frenchii*, its principal importance is that it is technically the genotype. Townsend's type of *M. datanarum* have not been located. The species was described from three specimens bred from *Datana* species and *Telea polyphemus*, also one collected specimen. From the description given, the species can not be differentiated from the *A. frenchii* complex, although Townsend⁹ contends that it has a different facies. Provisionally, the species is best regarded as a variety of *frenchii*.

Frontina sordida Curran undoubtedly belongs to the *frenchii* complex. Certain specimens are readily identified but when one is confronted with a large series the separation of this form is unsatisfactory. In this, as well as in all other varieties of *frenchii* which have been studied, the puparia appear identical.

Because so few tachinids show such marked variations in the adult and inasmuch as there is a suspected distinctiveness of some of the variant forms, extreme care has been taken to describe, with exactness, some of the characters of the type which are believed to be unpublished.

According to Williston, the species was described from five specimens bred from (*Jasoniades*) *Papilio glaucus* Linnaeus, November 26, 1881, Moosehead Lake, Me. (S. H. Scudder). The type is pinned with the puparium and labeled "From Turnus, Nov. 15, 1881, Moosehead Lake, Me., S. H. Scudder, type 476, *Masicera frenchii*." There is also an unissued puparium labeled as is the above. I was unable to locate any more of the type material. The type specimen is a male. The abdomen has been broken off but the remainder of the fly is in good condition. According to the original description, the abdomen has no red on the sides. The following measurements were taken with an eyepiece micrometer.

Front at vertex 0.33 the head width; at widest part (base of antennae) 0.46 the head width. Width of bucca 0.20 the head height; second antennal joint 0.20 the third (measurement taken with head held in profile). Front projecting beyond the eye 0.28 the head width (head held in profile, measurement taken at base of anten-

⁹ Smiths. Misc. Colls., No. 1803, p. 18, 1908.

nae). Front pulvilli nearly equal in length to the last two tarsal joints. Hind cross vein sinuate, distance from its end to small cross vein over twice its length; distance from end of hind cross vein to angle of fourth vein a little more than its length. Apical cell slightly open.

Face and front with slight yellowish cast which is by no means golden; facial depression cinereous, rather deep and about six times the width of either parafacial at narrowest part, the latter at this point less than the width of the third antennal joint. Vibrissal angles weak, the vibrissae a little above oral margin. Palpi very light yellow, thickly beset with short black spines. Antennae wholly black, excepting the extreme bases of second and third segments, which are faintly bordered with red. Arista thickened on basal third and then gradually tapering to apex. Facial ridges bristly three-fourths way to base of antennae. Frontals, eight in number, reaching from a point opposite the last bristles of the facial ridges to a point one-half way between base of antennae and vertex, the uppermost pair considerably weaker than the others. Two large reclinate bristles of equal strength continue along the line (a little outside) of the frontal rows. Inner vertical bristle strong, outer one much weaker and hardly differentiated from the immediate occipital hairs. Front vitta brownish, about one-third the width of front, sides of latter sparsely beset with weak bristles and hairs, none of which is equal in strength to the weakest frontal bristles. Occiput but slightly swollen below, at its greatest width scarcely equal to breadth of third antennal joint.

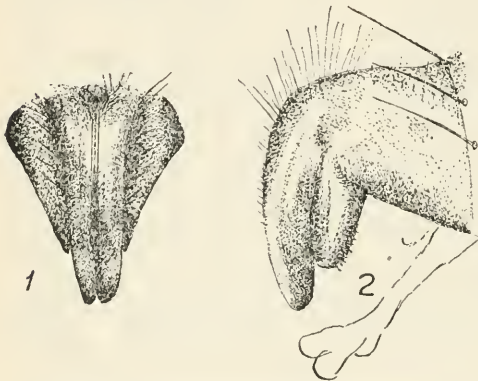
Thorax brownish black, moderately pollinose with the usual four vittae. Thoracic chaetotaxy: Before the suture, acrostichal 3; dorso-central 3; posthumeral 3; humeral 3; presutural 2; behind the suture, acrostichal 3; dorsocentral 4; intraalar 3; supraalar 3; postalar 1. Scutellum brownish black, gray pollinose at base, the posterior third and entire border yellow as palpi and bearing three pairs of marginal bristles besides the cruciate apical pair, intermediate pair much weaker than the others; disk thickly beset with small hairs and bearing a pair of weak bristles.

Sternopleura with three strong and one weak bristles. Pteropleural bristle small, about the size of the weakest sternopleural bristle. Legs black. Mid tibiae with one long bristle on the outer front side near middle, above it a smaller one about one-half its size but much stronger than the adjacent ones; two hind bristles, the uppermost a little above middle; and also a strong inner bristle just below middle. The tibial spurs are as usual, one on outside, one in front, two on inner side, and a smaller one behind. Hind tibiae evenly ciliate with one longer bristle a little way below the middle.

Wings hyaline, third vein with three bristles at base and the costal spine short, scarcely discernible.

In his original description, Williston merely cites the characters which he considered differentiated the species from *archippivora*. Of the latter species his description of the abdomen reads as follows: "Abdomen black, short, thickly gray pollinose, variable in different reflections; second segment with a posterior pair of bristles, no median bristles on this and the next segment; the general covering of short bristles well differentiated from the long bristles."

The description that follows is of a male from Massachusetts bred from the same host as was Williston's species, compared with his type and regarded as typical. First segment black, subshining except at venter where it is thinly gray pollinose; second and third



FIGURES 1 AND 2.—ACHAETONEURA FRENCHII (WILLISTON), MALE GENITALIA. 1, FROM BEHIND; 2, SIDE VIEW

segments black, subshining, the dorsum and venter thinly gray pollinose, variable in different reflections but noticeably thicker at the bases, apices shining black both dorsally and ventrally; fourth segment black, gray pollinose, the tip black, subshining. First segment with one pair of median marginal bristles; second with a median marginal and lateral pair; third with a marginal row,

the bristles of which are equal in length to dorsum of fourth segment; fourth wholly covered with bristles, the marginal and submarginal rows being much the strongest.

Genitalia (figs. 1, 2) small, black, shining on sides, the dorsum without luster; forceps viewed from behind, at greatest width over one-half their length. Inner forceps shining black, fused for about one-half way, with the basal portions separated by a well defined keel. Viewed in profile, the inner forceps are slightly convex and terminate in blunt points, their length scarcely one-half the length of the fourth abdominal segment; outer forceps black or reddish, moderately broad at base and tapering slightly to rounded points.

Length, 6-7 mm.

The type is deposited in the Museum of Comparative Zoölogy, Cambridge, Mass.

The species is a decidedly complex one with a wide range and probably includes several undescribed forms which are at this mo-

ment inseparable on any characters known to the writer. In all of the material examined, the puparia (fig. 12) appear similar, the posterior spiracles are situated on about the same plane as the horizontal axis, and the slits vary in number and arrangement.

2. ACHAETONEURA EUCHAETIAE, new species

Differs from *A. frenchii* (Williston) in that the male genitalia are larger and of a different structure; thorax and abdomen more grayish pollinose; front pulvilli of male shorter; posterior spiracles of puparium situated some distance above longitudinal axis.

Front of male at vertex varying from 0.33 to 0.35, in female 0.32 to 0.35 the head width; at base of antennae, front of male 0.44 to 0.46, in female 0.41 to 0.47 the head width; buccal width varying from one-tenth to one-seventh the eye height; third antennal joint in male from four and one-half to five and one-half, in female from four to five times the second. Front in both sexes projecting beyond eye from one-half to three-fourths the eye width (head held in profile, measurement taken at base of antennae).

Front pulvilli of male about equal in length to the last tarsal joint. Hind cross-vein sinuate, distance from its end to small cross-vein varying from one-half to twice its length; distance from end of hind cross-vein to angle of fourth vein equal to or considerably less than its length. Apical cell open, third vein with two or three bristles at base.

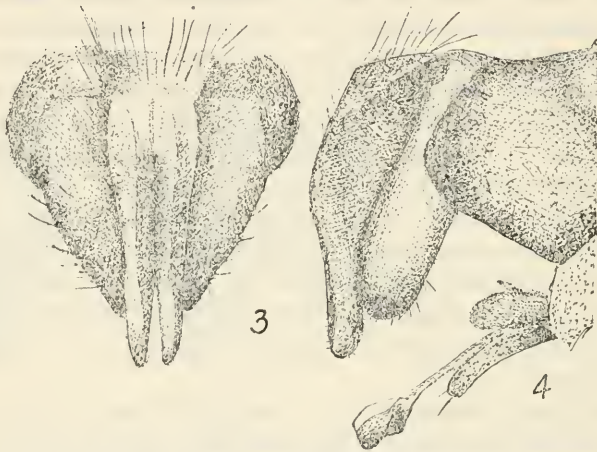
Face and front cinereous, the latter usually with yellowish cast; facial depression deep and more than three times wider than the width of one parafacial at narrowest part, which is at this point wider than the width of the third antennal joint. Occiput swollen below. Antennae in both sexes black, seldom even faintly reddish at base. Facial ridge bristles irregularly placed and often appearing as a double row. Frontal bristles variable in number, usually six or seven. Front of male densely beset with small bristles none of which equals in size those of the frontal row. Thorax and abdomen black, gray pollinose, usually sub-shining; thoracic chaetotaxy as in *frenchii*. Abdomen black, gray pollinose, anal segment densely so, never golden. First three segments bearing only marginal macrochaetae, the fourth moderately bristly on the apical three-fourths. Mid tibiae with one strong and one weak or two strong bristles on the outer front side; as in *frenchii* there are also two hind bristles and a strong inner one present on the mid tibiae. Hind tibiae evenly ciliate with one longer bristle.

Genitalia (figs. 3, 4) much larger than in the typical *frenchii*. Forceps viewed from behind, at widest part more than one-third their length; inner forceps fused at base and furnished with a very

short keel; viewed in profile, strongly convex on their outer edge and terminating in blunt points, their length equal to, or slightly more than one-half the length of the fourth abdominal segment; outer forceps broad, terminating in blunt rounded points.

Length, 9–11 mm.

The species is readily distinguished from all others of the genus by its puparium (fig. 13) which always has the posterior spiracles situated some distance above the longitudinal axis. It is further characterized by distinct biological traits. There is but a single generation, the host larvae being attacked in the early stages, the maggot hibernating in the first or second stage and completing its



FIGURES 3 AND 4.—*ACHAETONEURA EUCHAETIAE*, NEW SPECIES,
MALE GENITALIA. 3, FROM BEHIND; 4, SIDE VIEW

development in midsummer. Rarely is there more than one parasite to each individual host.

Described from 25 specimens of both sexes reared at the Gypsy Moth Laboratory, from *Euchaetias egle* Drury, by J. V. Shaffner, jr., and others. The type (G. M. L. 12130 M9) is from Redwood, N. Y.; emergence date, July 18, 1927. The allotype (G. M. L. 12130 K5), from Hingham, Mass. The paratypes are as follows: 2 males, Newburgh, N. Y., May 26–29, 1924 (G. M. L. 12130 J8); 1 female, Saratoga Springs, N. Y., June 6, 1924 (G. M. L. 12130 J13); 1 male and 1 female, Crownpoint, N. Y., May 5–17, 1924 (G. M. L. 12130 J15); 2 males, Natural Bridge, N. Y., July 19, 1927 (G. M. L. 12130 M8); 3 males and 1 female, Hingham, Mass., July 8–9, 15–24, 1925 (G. M. L. 12130 K5); 1 male, Bernardville, N. J., August 1, 1927 (G. M. L. 11741 M17); 2 males, North Branch, N. J., July 21–27, 1927 (G. M. L. 11741 M9); 1 female, North Branch, N. J., August 4, 1927 (G. M. L. 11741 M7); 1 male, Somerville, N. J., July 18, 1927 (G. M. L.

11741 M3); 1 female, Somerville, N. J., July 10, 1924 (G. M. L. 11741 J12); 1 female, Somerville, N. J., September 26, 1922 (G. M. L. 11741 H14); 1 male, Somerville, N. J., August 8, 1927 (G. M. L. 11741 M4); 1 female, Pierrepont, N. Y., July 27, 1927 (G. M. L. 12130 M12); 1 male, Bridgewater, N. J., August 9, 1927 (G. M. L. 11741 M6); 1 female, Holliston, Mass., July 13, 1925 (G. M. L. 12130 K6); 1 male, Milford, Pa., July 21, 1926 (G. M. L. 12130 L5). Other specimens from about the same localities as the above and from which the types were chosen, number close to 150 specimens.

Type.—Male. Cat. No. 43047, U.S.N.M.

3. ACHAETONEURA ANISOTAE, new species

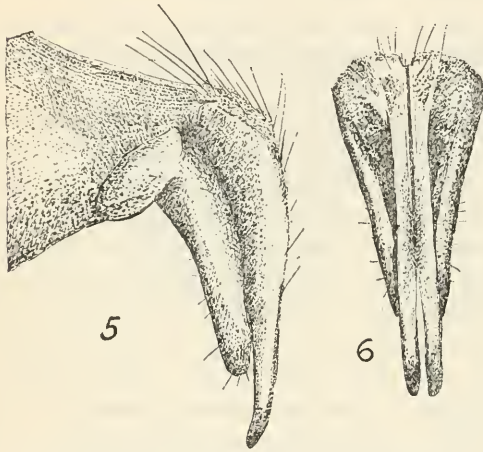
Differs from the closely allied species, *frenchii*, *euchaetiae*, and *samiæ* primarily in the structure of the male genitalia and the front tarsi of female.

Front of male at vertex varying from 0.28 to 0.29, in female 0.33 to 0.34 the head width; front at base of antennae, in male 0.37 to 0.39, in female 0.43 to 0.44 the head width; bucca measuring from one-fifth to one-seventh the eye height; third point of antennae in male from six to seven, and in female from four and one-half to five and one-half times the second. Front in both sexes projecting beyond eye from one-half to three-fourths eye width (head viewed in profile measurement taken at base of antennae). Front pulvilli of male equal to or somewhat longer than last tarsal joint. Front tarsi of female noticeably enlarged. This character appears constant in all of the material examined but it is not confined to *anisotae* alone. It occurs to some slight extent in the *frenchii* complex, especially in those forms bred from *Datana* spp. Hind cross vein sinuate, distance from the end to small cross vein variable, usually about one and a half times its length; distance from end of hind cross vein to angle of fourth vein equal to or considerably less than its length, last section of fourth vein usually sinuate, the angle rounded, apical cell open.

Face and front cinereous, usually the latter with a yellowish cast, more pronounced in female, facial depression deep and more than three times the width of one parafacial at narrowest part, which is at this point about the width of the third antennal joint. Occiput swollen below. Antennae in both sexes black, in female slightly reddish at junction of last two joints. Ciliation of facial ridges variable, usually a single row of evenly placed bristles, sometimes the bristles irregularly arranged and appearing as a double row.

Frontal row bristles varying in number from six to nine, usually the two uppermost pairs reclinate, in some specimens three pairs, or two on one side and three on the other. Front in both sexes

sparsely clothed with fine hairs and sometimes an occasional bristle, none of which, however, is equal in size to those of the frontal row. Thorax black, gray pollinose, usually subshining, the thoracic chaetotaxy as in *frenchii*. Scutellum black, gray pollinose, the apex sometimes reddish and bearing three pairs of strong and one pair of weaker marginal bristles besides the apical ones which are directed upwardly, being either parallel or cruciate. Abdomen black, gray pollinose, subshining; anal segment concolorous or with a yellowish tint, more pronounced in female. Sides of intermediate segments often reddish. First three segments with only marginal macrochaetae, the fourth moderately bristly on the apical three-fourths.



FIGURES 5 AND 6.—ACHAETONEURA ANISOTAE, NEW SPECIES, MALE GENITALIA. 5, SIDE VIEW; 6, FROM BEHIND

Mid tibiae with one strong and one smaller bristle above it, or rarely with two strong bristles of equal strength, on the outer front side. As in *frenchii* there are also two hind bristles and a strong inner one present on mid tibiae. Hind tibiae evenly ciliate with one longer bristle.

Genitalia (figs. 5, 6) much larger than in the typical *frenchii*. Forceps viewed from behind, at widest part less than one-third their

length. Inner forceps fused for about one-half their length and furnished with well-defined keel; viewed in profile, they are sinuate, slender, and terminate in fine points, their length over three-fourths that of the length of the fourth abdominal segment; outer forceps slender, also terminating in fine points.

Length, 8–11 mm. Medium to large-sized flies decidedly more robust than the typical *frenchii* and usually attaining the maximum size.

The puparium appears similar to *frenchii*; the posterior spiracles are situated about on the longitudinal axis and the arrangement and number of slits apparently vary to a considerable extent.

Described from 25 specimens of both sexes reared at the Gypsy Moth Laboratory from *Anisota senatoria* Smith and Abbot, by J. V. Schaffner, jr., and others. The type (G. M. L. 11776 K1) is from New Brunswick, N. J.; date of emergence July 18, 1925. The allotype (G. M. L. 11776 K1) from New Brunswick, N. J. The para-

types as follows: 1 female, Cromwell, Conn., July 26, 1926 (G. M. L. 12431 L4); 1 male, Deep River, Conn., July 27, 1928 (G. M. L. 12431 N5); 4 males and 1 female, Westerly, R. I., June 26–July 13, 1922 (G. M. L. 12431 G6b); 1 male, Westerly, R. I., July 23, 1923 (G. M. L. 12431 H1); 1 male, Westerly, R. I., July 3, 1923 (G. M. L. 12431 H1a); 1 female, Alexandria, N. Y., July 26, 1926 (G. M. L. 12431 L1); 6 males and 2 females, New Brunswick, N. J., July 11–16–18–20–24, 1925–July–3–3, 1925 (G. M. L. 11776 K1); 2 males and 1 female, Mystic, Conn., July 11–19–30, 1923 (G. M. L. 12431 H1b); 1 male, Putnam, Conn., June 2, 1921 (G. M. L. 12431 F2b); 1 male, Deep River, Conn., July 19, 1928 (G. M. L. 12431 N5). Other specimens from the same localities as the above number about twenty-five.

Type.—Male. Cat. No. 43048, U.S.N.M.

4. ACHAETONEURA SAMIAE, new species

Differs from *frenchii*, *euchaetiae*, and *anisotae* in that the front has an irregular number of supernumerary bristles outside of the frontal row which are equal to the latter in strength. This character is more pronounced in the males. Fourth segment of abdomen densely bristly. Posterior spiracles of puparium in a depression and situated on longitudinal axis.

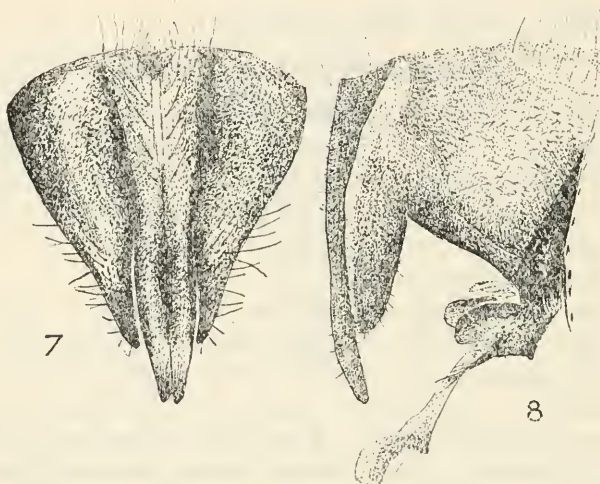
Front of male at vertex varying from 0.30 to 0.33, in female from 0.35 to 0.38 the head width; at base of antennae, front of male 0.39 to 0.44, in female 0.46 to 0.47 the head width; buccal width varying from one-eighth to one-fifth the eye height; third joint of antennae in male from four to five and in female from three and one-half to four times the second. Front in both sexes projecting beyond eye from one-fourth to nearly eye width, usually more so in female (head held in profile, measurement taken at base of antennae). Front pulvilli of male nearly equal in length to the last two tarsal joints. Hind cross vein sinuate, distance from its end to small cross vein varying from a little over once to twice its length, distance from end of hind cross vein to angle of fourth vein equal to or considerably less than its length. Apical cell open.

Front and face wholly cinereous or with slight yellowish cast, facial depression cinereous, often appearing soiled, deep, its width about three times that of one parafacial at narrowest part, which is at this point wider than the third antennal joint. Occiput swollen below. Antennae of male black, sometimes a little reddish at base, more so in female. Bristles of the facial ridges irregularly placed, often appearing as a double row. Frontal bristles variable in strength, number, and uniformity of alignment. Sides of front with a number of bristles equal in size to those of the frontal row. Oc-

asionally there are a few scattered fine hairs below the lowest frontal bristles.

Thorax and scutellum black, gray pollinose, usually subshining; thoracic chaetotaxy as in *frenchii*. Abdomen black, gray pollinose, the pollen varying greatly in density and pattern; anal segment usually concolorous with the remainder of abdomen, but frequently more thickly gray pollinose, never golden. First three segments of abdomen with marginal macrochaetae, the fourth wholly bristly, excepting the extreme base. Abdominal hairs often suberect along the dorsum.

Mid tibiae with one strong and one weak or, more rarely, with two strong bristles nearly equal in strength, on the outer front side.



FIGURES 7 AND 8.—ACHAETONEURA SAMIAE, NEW SPECIES,
MALE GENITALIA. 7, FROM BEHIND; 8, SIDE VIEW

As in *frenchii*, there are also two hind bristles and a strong inner one present. Hind tibiae evenly ciliate with one longer bristle. Wings hyaline with one or two bristles at base of third vein.

Genitalia (figs. 7, 8) much larger than those of the typical *frenchii*. Forceps viewed from behind, at widest part, more than one-third as wide as long. Inner forceps black, fused for about one-half their length and furnished with a well-defined keel; viewed in profile nearly straight and tapering to fine points, their length nearly three-fourths that of length of fourth segment; outer forceps black or reddish, broad at base and moderately tapering to rounded points.

Length, 7–9 mm.

The species is readily distinguished from all others of the genus by its puparium (fig. 14), which is usually weak, light brown in color, with the posterior spiracles always located in a depression on

the horizontal axis. The species is further characterized in that there are two generations, the host larvae being attacked in their intermediate and later stages, the maggot hibernating in the third stage, and the adult emerging in the spring or early summer. It is rarely recovered solitarily from its host species.

Described from 25 specimens of both sexes reared at the Gipsy Moth Laboratory, from *Samia cecropia* Linnaeus, by J. V. Schaffner, jr., and others. The type (G. M. L. 12119 H4a) is from Glenborn, Me. (Carmel, Me., February 3, 1923); emergence date under laboratory conditions, March 1, 1923. The allotype (G. M. L. 12119 H4b), Carmel, Me. The paratypes as follows: 1 male and 1 female, Bangor, Me., March 24, 1922 (G. M. L. 12119 G5); 3 males and 4 females, Bangor, Me., March 23–27, 1923 (G. M. L. 12119 H4d); 2 males and 2 females, Bangor, Me., May 23–28, 1923 (G. M. L. 12119 H4g); 2 males, Greenfield, N. H., April 1–4, 1927 (G. M. L. 12119 N2); 2 females, Margaretville, N. Y., April 10–11, 1924 (G. M. L. 12119 J5); 1 female, Putnam Valley, N. Y., April 6, 1927 (G. M. L. 12119 N6); 1 male, Boxford, Mass., May 16, 1927 (G. M. L. 12119 N7); 2 males, Carmel, Me., February 3–13, 1923 (G. M. L. 12119 H4a); 2 males, Newport, R. I., April 17, 1924 (G. M. L. 12119 J6). Besides the type material, several hundred specimens, reared from *S. cecropia* from about the same localities as the above, have been examined. As regards distribution, it is interesting to note that there is material of this species at the United States National Museum bred from *Samia rubra* Behr, from California, by J. A. Kusche, 1919.

Type.—Male. Cat. No. 43049, U.S.N.M.

5. ACHAETONEURA MELALOPHAE Allen

Achaetoneura melalophae ALLEN, Trans. Amer. Ent. Soc., vol. 52, p. 195, 1926.

Male.—Front at narrowest part one-fourth diameter of head; face and front yellowish pollinose, often blackish at vertex. No strong bristles outside of frontal row; facial ridges bristly on lower half; antennae black, third joint in male about five and in female about four times the length of the second; bucca from one-fourth to one-fifth the eye height.

Thorax black, gray pollinose; scutellum often brownish at tip; chaetotaxy as in *frenchii*.

“Abdomen black or at most with an indistinct spot of red at sides of second segment, densely overlaid with gray pollen in which irregular black areas appear, when viewed from behind, in addition to two spots on median dorsal line; the rather coarse suberect bristly hairs are surrounded at their insertions by conspicuous round black

spots; fourth abdominal segment densely pollinose to apex" (Allen); first two segments with a median marginal pair, third with marginal row, and fourth more or less thickly bristly.

Legs black; mid tibiae with one strong bristle, sometimes one weaker one above it; hind tibiae evenly ciliate with one longer bristle, front pulvilli longer than last tarsal joint.

Wing venation as in *frenchii*.

Genitalia (fig. 9) apparently of the same structure as in the *frenchii* complex. Differs from the typical *frenchii* in that the entire genitalia are larger and the inner forceps are inclined inwardly at their apices and terminate in more slender points.

Length, 5-8 mm.

Distribution.—Eastern part of the United States.

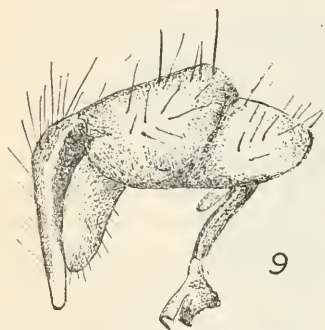


FIGURE 9.—ACHAETONEURA MELALOPHAE ALLEN, MALE GENITALIA, SIDE VIEW

According to Allen, *melalophae* is readily distinguished by its more slender shape and smaller size, narrow front, deep golden pollen of face and front, and the mottled, yellowish gray pollination of the abdomen which is in contrast to the more uniform sheen of *frenchii*.

6. ACHAETONEURA CUCULLIAE, new species

Front of female at vertex 0.33, at base of antennae 0.41 the head width; front and face cinereous, the former without sheen, the latter more or less shiny; frontal bristles ten in number, the intermediate pairs weaker than those which precede or follow them, the two uppermost ones reclinate. When viewed from front, the inner eye margins are but slightly divergent; frontal bristles descending nearly or quite to the lower half of the head; facial ridges bristly on lower half, the uppermost bristles hardly reaching the lowest frontals. Two pairs of large proclinate orbital bristles; inner verticals large, the outer ones one-third their size. Facial depression cinereous, shining, and about four times as wide as either parafacial. The antennae appear to arise at a point about two-thirds the head height, black, the second joint about one-half the length of the third, and the arista tapering from base to apex. Palpi yellow; bucca narrow, about one-eighth eye height.

Thorax black, gray pollinose, bearing four dorsocentral and four sternopleural bristles; lateral bristles strong. Scutellum with three pairs of marginal bristles besides the apical ones.

Abdomen black, thinly gray pollinose with a slight bluish cast; first segment black, destitute of bristles; second segment with one median pair; third with marginal row; fourth wholly covered with

bristles of unequal strength none of which is as long as those of the third segment.

Mid tibiae with one strong outside bristle near middle. Hind tibiae evenly ciliate with one long bristle.

Wing venation as in *frenchii*.

Length, 6–8 mm.

Described from one female labeled, "Emerged Sept. 27, 1917; from *Cucullia* sp., Falls Church, Va., Sept. 2, 1917." The puparium is pinned with the fly and seems to agree with that of *frenchii*.

Type.—Female. Cat. No. 43050, U.S.N.M.

Placed provisionally as this species are specimens of both sexes from the Gipsy Moth Laboratory, bred by J. V. Schaffner, jr., from *Dasylophia anguina* Smith and Abbot from larvae collected at Maybrook, N. Y., June 23–26, 1924 (G. M. L. 12164 J 147). This material, although agreeing fairly well with the type excepting in minor characters, may eventually prove to be a variety. Front of male 0.23, of female 0.30 the head width; at widest part (base of antennae), in male 0.40, in female 0.44 the head width. Bucca one-fifth the eye height, in female slightly less. Eyes very faintly pubescent. Face and front silvery pruinose. Frontals variable in number and not of uniform strength. Antennae black, the third joint in both sexes about two and one-fourth times the second. Arista gradually tapering. Facial ridges bristly one-half way. The thoracic chaetotaxy appears the same as in *cuculliae* excepting that, in some instances, the apical scutellar bristles are not directed upwardly. Abdomen black, gray pollinose, first segment without bristles, second with or without one strong median marginal pair, third with marginal row of strong bristles which are a fourth longer than any of these of the last segment, fourth segment moderately bristly, with well-defined marginal and submarginal rows, the latter strongest. In all of the specimens, the anal segment appears less bristly above than in the type.

Legs black, the mid tibiae with one long bristle on outside near middle as in the type specimen; hind tibiae evenly ciliate with one longer bristle.

Length, 5–9 mm.

One female labeled, "Parasite on *Dasylophia anguina* Smith, Beverly, Mass. Collection G. V. Riley," and two females labeled, "55730 2X, Sept., '92." The first of these three specimens is probably the one referred to *Frontina frenchii* or *aletiae* by Coquillett.¹⁰ Another specimen, a female from Beltsville, Md., collected September 3, 1916, by W. S. McAtee, also appears to be of this species. In this specimen, the first segment bears no marginal bristles and the second has but one weak bristle and one longer hair.

¹⁰ Revision of N. A. Tachinidae, p. 15–16, 1897.

7. *ACHAETONEURA DIMMOCKI*, new species

Front at vertex in male 0.30, in female 0.33 the head width; inner eye margins moderately divergent, a little more so in male than in female; front and face cinereous, the latter subshining and bearing several strong bristles outside of frontal row; frontal bristles variable in number and strength; frontal vitta broad, light-brown as are the eyes, and measuring about one-third width of front. Antennae in both sexes four-fifths the face, third joint black, the second brownish, in male about five times and in female three times the length of the second; arista thickened on basal half and tapering therefrom; facial ridges bristly about one-half way (weakly); palpi yellow; bucca one-eighth eye height.

Thorax black, gray pollinose, chaetotaxy as in *frenchii*. Scutellum brownish, black at base, and bearing three pairs of marginal bristles besides the decussate apical pair which lie either horizontally or upwardly directed. Disk with one pair of widely separated bristles which arise near the middle.

Abdomen black, gray pollinose, the pollen thickest in a narrow band at bases of segments two and three. Segments one and two each with a pair of marginal bristles, third with a marginal row of strong bristles, as long as the fourth segment and longer than any of the bristles thereon. Last segment bristly on its apical half; abdominal hairs of male erect, in female many erect short bristles or hairs extending along the dorsum of the abdomen which are in sharp contrast to the adjacent depressed hairs.

Mid tibiae with three or more strong bristles on the outer front side near middle. Hind tibiae evenly but not densely ciliate with one longer bristle. Front pulvilli of male longer than the last tarsal joint.

Wings with normal venation.

Genitalia apparently as in *frenchii* complex.

Length, 7-8 mm.

Described from two males and three females collected on *Rhus copallina*, June 5, 1898. Labeled "Springfield, Mass., G. Dimmock." The specimens bear the numbers, "1346-1346a-1346b-1346d-1346E. Also, one male and two females labeled, "bred from *Hyperchira io.*, Tatham, Mass., July 15, G. Dimmock," numbered "1516b-1516c-1516d."

Type.—Male. Cat. No. 43051, U.S.N.M.

8. *ACHAETONEURA ARCHIPPIVORA* (Williston)

Tachina archippivora RILEY, 3d Rept. Ent. Mo., p. 150, 1871 (no description or figure).

Masicera archippivora WILLISTON, Scudder's Butterflies of New England, vol. 3, p. 1923, 1889.

Meigenia websteri TOWNSEND, Can. Ent., vol. 23, p. 206, 1891.

Phorocera promiscua TOWNSEND, Psyche, vol. 6, p. 84-85, 1891.

Ypophyaemyia malacosomae TOWNSEND, Ins. Ins. Mens., vol. 4, Nos. 7-9, p. 75, 1916.

Parafrontina apicalis BRAUER and BERGENSTAMM, Zweif. Kais. Mus. Wien, pt. 6, p. 115, 1893.

Masicera pauciseta COQUILLET, Revision of N. A. Tachinidae, p. 114, 1897.

Masiceropsis pauciseta (COQUILLET) TOWNSEND, Ent. News, vol. 27, p. 178, 1916.

Meigenia websteri Townsend was considered by Coquillett (Revision of N. A. Tachinidae, p. 107; 1897) as a synonym of *frenchii*. Aldrich, who has seen the type specimen at the University of Kansas, believes it to be *archippivora* and not *frenchii*. According to Townsend's description, the face and front are nearly one-half the head width in female and about one-third in male, arista thickened for more than one-half its length, claws and pulvilli not elongated, all characters which would tend to corroborate Aldrich's determination. Townsend¹¹ evidently still considers the species distinct and further remarks that his recently erected *Ypophyaemyia malacosomae* may prove to be a subspecies of it. In the United States National Museum there is a female specimen (C. V. Riley Collection), labelled "*Ypophyaemyia websteri* Tns.," in Townsend's handwriting which I am unable to distinguish from *archippivora*. *Phorocera promiscua* Townsend was likewise considered synonymous with *frenchii* by Coquillett.¹² Aldrich has also seen the type specimen of this species and believes it to be *archippivora*. While the description of *P. promiscua* best fits *archippivora*, it will equally well apply to an unnamed variety of *frenchii* that is frequently bred from *Malacosoma* spp. and which, in some instances, so closely approaches *archippivora* that the separation of the two forms becomes extremely difficult. Townsend¹³ still believes the species to be distinct from *frenchii* and *datanarum* although closely related to the latter. For the time being, at least, the species is best disposed of in the *archippivora* complex. The type specimens of *Ypophyaemyia malacosomae* Townsend and *Masiceropsis pauciseta* (Coquillett) have been examined by the writer and the two species placed in the *archippivora* complex. Neither of them is identical with the type of *archippivora* but their counterparts are to be found in a series of specimens reared from host material collected in New England and which is, in most part, inseparable from *archippivora*. *Parafrontina* Brauer and Bergenstamm, type *apicalis* Brauer and Bergenstamm was considered by its authors as a subgenus of *Frontina*.¹⁴

¹¹ Ins. Ins. Mens., vol. 4, Nos. 7-9, p. 76, 1916.

¹² Revision, N. A. Tachinidae, p. 107, 1897.

¹³ Smiths. Misc. Colls., No. 1803, p. 18, 1908.

¹⁴ Zweif. Kais. Mus. Wien, pt. 6, p. 212, 1893.

Coquillett¹⁵ believed the two genera to be synonymous as did also Aldrich.¹⁶ Townsend¹⁷ admits that there is a very close relationship between *Parafrontina*, *Achaetoneura*, *Masiceropsis*, and *Ypophaeomyia* but differentiates the first from the others by its thickly pilose eyes. Obviously there is a mistake here, as an examination of the type material (Texas, Belfrage) shows the eyes to be distinctly naked. The species undoubtedly belongs to the *archippivora* complex even though not identical with the type of *archippivora*. *Ypophaeomyia malacosomae brasiliensis* Townsend¹⁸ from Brazil, *Zygofrontina capitas* Townsend¹⁹ from Peru, and species from South America which are in the United States National Museum collection labelled "near *archippivora*" are allied and exceedingly close to *archippivora* but their distribution excludes them from consideration in this paper.

Front at vertex in male 0.35 to 0.38, in female 0.35 to 0.37 the head width; at widest part (base of antennae) in male 0.48 to 0.49, in female 0.48 to 0.50 the head width; width of bucca about one-sixth the eye height; third antennal joint in male from five to seven and in female four and one-half to five times the second; front projecting beyond eye from one-half to three-fourths eye width; front pulvilli of male less than length of last tarsal joint. Hind cross vein sinuate, distance from its end to small cross vein nearly twice its length, sometimes considerably less; distance from end of hind cross vein to angle of fourth vein about equal to its length or one-half again as much. Apical cell open.

Face and front cinereous, the former silvery, the latter often with golden tinge; facial depression shallow or deep, dependent upon drying; parafacials usually broad, at narrowest part wider than width of third antennal joint; palpi light yellow, sparsely bristly.

Antennae black, variable in length, usually about four-fifths the face, sometimes only three-fourths and frequently reaching the oral margin; viewed in profile, the outer edge of the third joint is normally straight, sometimes concave, black or reddish at base in male, in female often reddish on basal half and rarely entirely red. Arista thickened on basal one-half to three-fourths. Facial ridges usually bristly three-fourths way to antennae, sometimes only one-half way. Frontal bristles variable, usually eight or nine with the uppermost ones weak, usually two large reclinate bristles of about equal strength continuing along the line (a little outside) of the frontal rows. Inner vertical bristle strong, outer one about one-

¹⁵ Revision of N. A. Tachinidae, p. 105, 1897.

¹⁶ Cat. Dipt., p. 462, 1905.

¹⁷ Bull. Amer. Mus. Nat. Hist., art. 6, vol. 37, p. 232, 1917.

¹⁸ Idem., p. 231, 1917.

¹⁹ Proc. U. S. National Museum, vol. 49, No. 2115, p. 427, 1915.

fourth its size. Frontal vitta variable in breadth and outline, usually the sides nearly parallel from base of antennae to the lowest ocellus, sometimes rapidly divergent. Front, outside of frontal rows, in male sparsely bristly or sometimes with one to three bristles the size of the weakest frontals, in female this region very weakly hairy. Occiput slightly swollen below.

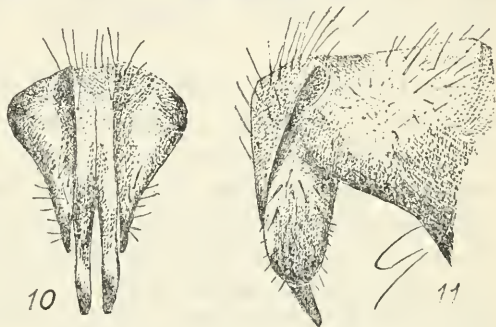
Thorax black, gray pollinose, variable in density and usually with a goldent cast. Thoracic chaetotaxy: Before the suture, acrostichal 3; dorsocentral 3; posthumeral 3; humeral 3; presutural 2; behind the suture, acrostichal 3; dorsocentral 3; intraalar 3; postalar 1. Scutellum black, gray pollinose, the tip often yellowish or red and bearing three pairs of marginal bristles besides the usually cruciate apical pair which are rarely parallel. Sternopleura usually with four bristles. Pteropleural bristle small, about the size of the weakest sternopleural bristle.

Abdomen black, gray pollinose, with or without a yellowish tinge, the pollen variable in density although as a rule much more thickly pollinose than in *frenchii*; sides of second segment concolorous

with the rest of the abdomen or reddish. First segment usually without median marginal bristles, although sometimes a weak pair are present; second segment with one pair median marginal, or rarely without any; third with marginal row, fourth with a weak marginal row and a much stronger submarginal one. Basal three-fourths of this segment destitute of strong bristles. Abdominal hairs depressed.

Legs black, sometimes brownish, mid tibiae usually with one strong and one weaker bristle above it or only one strong bristle on outer front side, two hind bristles, the uppermost a little above the middle, and also a strong inner bristle just below middle. Tibial spurs as usual. Hind tibiae evenly ciliated with one longer bristle. Wings hyaline, third vein with two or three bristles at base; costal spine short, scarcely discernible.

Genitalia (figs. 10, 11) black in most part, outer forceps brownish; forceps viewed from behind at widest part over one-half as wide as long; viewed in profile, the inner forceps slender, tapering slightly to fine points, almost straight, and with a very slight concav-



FIGURES 10 AND 11.—ACHAETONEURA ARCHIPIVOIRA (WILLISTON), MALE GENITALIA. 10, FROM BEHIND; 11, SIDE VIEW

ity on the outer side near their apices, their length measuring about three-fourths that of the fourth segment; outer forceps broad, tapering but slightly to blunt rounded points.

Length, 5–8 mm.

The species appears to be widely distributed over the United States.

9. *ACHAETONEURA TEXANA*, new species

Front at vertex in both sexes 0.41 the head width; front, face, and postorbital region deep golden pollinose, facial depression less so; frontal vitta in male one-fourth the frontal width, in female somewhat wider. Lowest and uppermost frontal bristles strongest, the intermediate ones weak, facial ridges bristly a little over one-half way in male, in female nearly three-fourths way. Bucca about one-eighth the eye height, palpi yellow, swollen at tip and in male thickly clothed with short black hairs which give it a very dark appearance.

Thorax black, gray pollinose, bearing four dorsocentral and four sternopleural bristles; scutellum with four pairs of marginal bristles besides the apical pair which in the type specimen are parallel and directed upward, in female decussate.

Abdomen black, gray pollinose, anal segment golden pollinose; first and second segment with median marginal bristles, third with a marginal row of strong bristles which are longer than any of those of the fourth segment; fourth segment bristly on apical two-thirds.

Mid tibiae with one long and one shorter bristle above it on the outer front side near middle. Hind tibiae evenly ciliate with one longer bristle. Front pulvilli of male less than the length of the last tarsal joint.

Genitalia apparently as in *archippivora*.

Wing venation normal, hind cross vein noticeably sinuate.

Length, 9–10 mm.

Described from one male collected at Dilly, Texas, labeled "LI, 1924, #2 Reinhard" and one female labeled: "Dist. Fedrl. Mex. L. Conradi, Collector—37."

Type.—Male. Cat. No. 43052, U.S.N.M.

10. *ACHAETONEURA WESTONIA*, new species

Front of male 0.47 the head width; inner eye margins nearly parallel; facial ridges bearing two rows of irregularly placed bristles which extend three-fourths way to base of antennae; parafacials broad, at narrowest part each one-half as wide as the facial depression; bucca one-third eye height; vibrissae on level with oral margin; antennae black, five-sixths the length of face; third joint over six times the length of second; palpi yellow, slender, not swollen at tip.

Thorax black, gray pollinose, bearing four dorsocentral and four strong sternopleural bristles. Scutellum brownish with three pairs of marginal bristles besides the decussate apical pair, also a discal pair.

Abdomen black, quite thickly gray pollinose as in *archippivora* and bearing median marginal bristles on the first three segments, the fourth bristly on its apical half.

Mid tibiae with one large and one small bristle above it on outer front side near middle. Hind tibiae evenly ciliate with one longer bristle. Front pulvilli of male less than length of last tarsal joint.

Wing venation normal, base of third vein with two or three bristles; costal spine small but distinct in the type specimen.

Genitalia apparently as in *archippivora*.

Length, 10 mm.

Described from one male from Alameda County, Calif.; labeled: "Feb. 45 °."

Type.—Male. Cat. No. 43053, U.S.N.M.

11. ACHAETONEURA TESTACEA, new species

Frontina violenta Coquillett, Revision of N. A. Tachinidae, p. 108, 1897 (not Walker List of Dipterous Insects, part 4, p. 788, 1849).

Front of male at narrowest part (a point half way between vertex and base of antennae) 0.24 the head width, in female the front at narrowest point (vertex) 0.30 the head width; facial ridges bristly from one-third to one-half way to antennae. Front and face cinereous, the former with slight golden tinge; antennae black, third joint in male three and one-half to four, and in female from three to three and one-half times the second; bucca about one-fifth eye height.

Thorax black, gray pollinose; chaetotaxy as in *frenchii*; scutellum with three pairs of strong marginal bristles besides a pair of cruciate apical ones.

Abdomen stout, yellow or brownish in color with a poorly defined, wide, black dorsal vitta which extends over the larger part of dorsum, in female the anal segment mostly gray pollinose; first segment without marginal bristles; second segment with one pair of strong median marginal bristles; third with a marginal row of strong bristles which are longer than those of the fourth segment; fourth segment bristly on apical two-thirds, the bristles of unequal strength, those at apex being strongest.

Legs brownish. Mid tibiae with one long bristle on outer front side near middle; hind tibiae ciliate with one longer bristle. Front pulvilli of male longer than last tarsal joint.

Wing venation normal.

Length, 7-8 mm.

The species is described from two males and two females bred from *Pholus vitis* Linnaeus, Washington, D. C., the flies issuing October 8, 1884; also a specimen collected by R. P. Currie, Plummer Island, Md., June 3, 1902.

The reared specimens are evidently some of the material Coquillett had before him when working on his Revision of Tachinidae. The species is exceedingly close to *aletiae* (Riley) from which it is differentiated principally by its marginal bristles on the second abdominal segment and color characters; *testacea* differs from *pholi* in its more slender form, coloration and density of pollen along the thorax, the latter character being readily recognized when a series of specimens are examined.

Type.—Male. Cat. No. 43054, U.S.N.M., from Washington.

12. ACHAETONEURA ALETIAE (Riley)

Tachina aletiae RILEY, Can Ent., vol 11, p. 162, 1879.

Tachina fraterna COMSTOCK, Rept. Commr. Agri., 1879, p. 303, 1880.

The type specimen can not be located in the United States National Museum. Such being the case, the species is redescribed from one male and two females from Centerville, Fla., which are considered as typical. These specimens were reared from *Alabama argillacea* Hübner and are labelled, “#468 L08, issued Nov. 23, 1878.” Another female varying but slightly from the above is included as typical. This specimen is labelled as follows: “#2359—bred from *aletiae* pupae, disclosed Aug. 21, 1881, Hubbard; collection C. V. Riley—104.” It also bears Brauer and Bergenstamm determination label, “*Prosopaea* sp.” and is evidently the specimen sent by Riley to them for identification.²⁰ The specimens above compare well with Riley's description excepting in the case of the one labeled *Prosopaea*, in which case the front and face are cinereous without trace of golden pollen.

Front of male at vertex 0.26, at widest part 0.34 the head width; in female at vertex 0.27, at widest part 0.34 the head width; face and front concolorous, ashy gray ground color tinged with golden; frontal vitta one-third the frontal width; frontals nine in number, the last two pairs reclinate. Antennae black, second joint brownish, in male about one-fourth the length of third, in female about one-third. Facial ridges weakly or strongly bristly for one-half to three-fourths their length. Bucca narrow, about one-tenth the eye height. Palpi yellow, eyes sparsely but distinctly pubescent under high magnification.

²⁰ See Coquillett's Revision N. A. Tachinidae, footnote No. 2, p. 105, 1897.

Thorax black, gray pollinose; chaetotaxy as in *frenchii*. Scutellum brownish, bearing four pairs of strong marginal bristles (the second pair from suture weakest) besides a cruciate apical pair.

Abdomen black, gray pollinose, particularly the bases of last three segments, sides of first and second segments sometimes reddish, anal segment sometimes wholly gray pollinose; no longer hairs or indication of marginal bristles on the first two segments; third with a marginal row which in the female are not so long as the fourth segment; in male the bristles of the third segment are stronger and equal to, if not longer than the fourth segment, fourth segment bristly on apical half, the bristles stronger in male than in female.

Legs black with a piceous tinge. Front pulvilli of male as long as last tarsal joint. Hind tibiae ciliate with one longer bristle. Mid tibiae with one long and one short bristle above it on the outer front side near middle.

Genitalia of male brownish; forceps viewed from behind at widest part scarcely half as wide as long; in profile the inner forceps are straight, sparsely hairy at base and along their sides, outer forceps stout.

Length, 8-9 mm.

The species appears to have a wide range in the United States.

13. ACHAETONEURA PHOLI, new species

Front of male at vertex 0.25, of female 0.28 the head width; face and front cinereous, the latter with a golden tinge; frontal bristles variable, in the male a row of eight to ten bristles of unequal strength besides the two reclinate upper fronto-orbital ones, in the female usually the lowest five or six strong, followed by several weaker ones; facialia of male weakly bristly for at least half their length, in female scarcely over one-third way; third joint of antennae in male four and one-half times, and in female four times the length of the second, second joint and base of third brownish, this color more conspicuous in the female; bucca one-sixth the eye height; palpi light yellow, swollen at tip and sparsely clothed with black hairs.

Thorax black, thickly gray pollinose tinged with yellow; sternopleural plate light gray pollinose; chaetotaxy as in *frenchii*. Scutellum black, gray pollinose, the tip brownish and bearing four pairs of marginal bristles besides the cruciate apical ones.

Abdomen black, subshining, bases of segments two to four grayish pollinose, the pollen especially noticeable on sides of intermediate segments, in female the pollen is of a lighter shade; first segment without median marginal bristles; second with a marginal pair scarcely discernible from the adjacent hairs, stronger in female;

third segment with marginal row of strong bristles which are longer than the fourth segment or any of the bristles thereon; fourth segment moderately bristly on its apical three-fourths. Abdominal hairs depressed.

The genitalia differ from those of *aletiae* in that, when viewed in profile, the tips of the inner forceps are turned backward and the sides and base of the forceps are more thickly bristly; outer forceps more slender.

Legs black, mid tibiae in male with one long bristle on the outside near middle, no trace of smaller one above it, in female one long and one short bristle. Hind tibiae thickly and evenly ciliate without any longer bristles; front pulvilli of male longer than last tarsal joint.

Wing venation normal.

Length, 8-9 mm.

Described from four males and eleven females reared from *Pholus* species, Springfield, Mass, (No. 2103) by G. Dimmock.

Type.—Male. Cat. No. 43055, U.S.N.M.

14. ACHAETONEURA SCHIZURAE (Townsend)

Masicera schizurae TOWNSEND, Psyche, vol. 6, p. 187, 1891.

Front of male at vertex 0.23 the head width; at widest part (base of antennae) 0.38 the head width; cinerous, as is also the entire face, no brassy tinge obvious; frontal bristles in a single row, one or two smaller bristles outside of them; facial ridges bristly about one-half way, the bristles not of equal strength; bucca one-eighth the eye height; antennae black, the third joint in male at least five times the second.

Thorax black, gray pollinose, the chaetotaxy as in *frenchii*; scutellum brownish, with four pairs of marginal bristles, the second pair from suture weakest; apical scutellar bristles short, vestigial in the type specimen.

Abdomen black, gray pollinose, the sides with a brownish tinge; abdominal hairs depressed. First segment black, without marginal bristles; second with a median pair (according to description these bristles are sometimes absent); third with a marginal row; fourth with long bristles on the apical border only.

Genitalia of male wholly brownish, apparently of the same structure as in *piperi* but more slender and lacking the conspicuous tuft of hairs at base of inner forceps.

Legs piceous, mid tibiae with one long and one shorter bristle above it. Hind tibiae evenly but not so densely ciliate as in *piperi* and with one longer bristle. Front pulvilli of male grayish, very long, nearly twice that of the last tarsal segment.

Wings with normal venation.

Length, 8-9 mm.

The above description is of one of the cotype specimens and varies somewhat from Townsend's description. His four specimens were reared from *Schizura unicornis* Smith and Abbot, at Manhattan, Kansas. Although considered synonymous by Coquillett, the species is positively not *frenchii* (Williston). In general appearance, the species resembles *testacea* but differs in form and coloration. The latter is small and more compact, *schizurae* larger and more robust with the apical scutellar bristles vestigial; it differs from *piperi* by its smaller and more slender form, the presence of one longer bristle among the even cilia of hind tibiae in male and the absence of a conspicuous tuft of hairs at base of inner forceps; from *frenchii* it may be separated by the absence of marginal bristles on the first segment, absence of strong apical scutellar bristles, and arrangement of bristles on the posterior segment of abdomen.

Townsend²¹ mentions *M. schizurae* as having been bred from larvae and pupae of *Euchaetias egle*, by S. A. Forbes, Illinois. In view of the fact that several species of *Achaetoneura* are separated with difficulty from *schizurae*, some confusion may exist as regards this record.

15. ACHAETONEURA PIPERI (Townsend)

Sturmia schizurae COQUILLET, Revision of N. A. Tachinidae, p. 113, 1897.

Argyrophylax piperi TOWNSEND, Smiths. Misc. Colls., No. 1803, p. 98, 1908, change of name.

Achaetoneura schizurae ALDRICH, Proc. Ent. Soc. Wash., vol. 31, p. 36, 1929.

The essential characters which distinguish *piperi* have been given in the table of species. The species is recognizable from Coquillett's description, to which may be added the following: Large robust forms, 10 to 12 mm. in length, the largest of the *Achaetoneuras*. Front of male at vertex 0.23, of female 0.30 the head width; at base of antennae, front of male 0.38, of female 0.41 the head width; horizontal diameter of head at vibrissae fully three-fourths that at base of antennae; front and face cinereous; facial ridges bristly from one-half to three-fourths way to the antennae; third antennal joint in male about four, in female, hardly three times the second, very broad, its length scarcely three times its breadth. In the female, the sides of the front are destitute of strong bristles outside of the frontal row; parafacials narrow in female, about one-fourth in median depression. Buccal area large when viewed from beneath, viewed from side the bucca about one-fifth the eye height.

²¹ Psyche, vol. 6, p. 467, 1893.

Thorax black, gray pollinose, the chaetotaxy as in *frenchii*; scutellum with four strong pairs of marginal bristles, also intermediate weaker ones besides the extremely weak apical pair.

Abdomen black, gray pollinose, first segment bare, second and third segments with marginal bristles, the fourth wholly covered except at extreme base, bristles at apex strongest. Abdominal hairs depressed.

The genitalia do not appear to have any characters to specifically differentiate the species from some of the closely allied species. They are light brown or yellowish in color, shining, and, when viewed from behind, the forceps at greatest width are nearly one-half their length; outer forceps stout; inner forceps a little longer than the outer and bearing at base a small but conspicuous tuft of upwardly directed hairs.

Mid tibiae with one large bristle and a smaller one above it on the outer front side near middle. Hind tibiae evenly and densely ciliate without a longer bristle in male; evenly, though less densely ciliate and bearing one longer bristle in the female. Front pulvilli of male smoky black and decidedly longer than last tarsal joint.

Wing venation normal, third vein at base with two or three bristles as in *frenchii*.

The material examined at the United States National Museum consisted of the type, a male reared from *Schizura ipomoeae* Doubleday, Pullman, Wash., and two females of the same lot from Coquillett's and Aldrich's material.

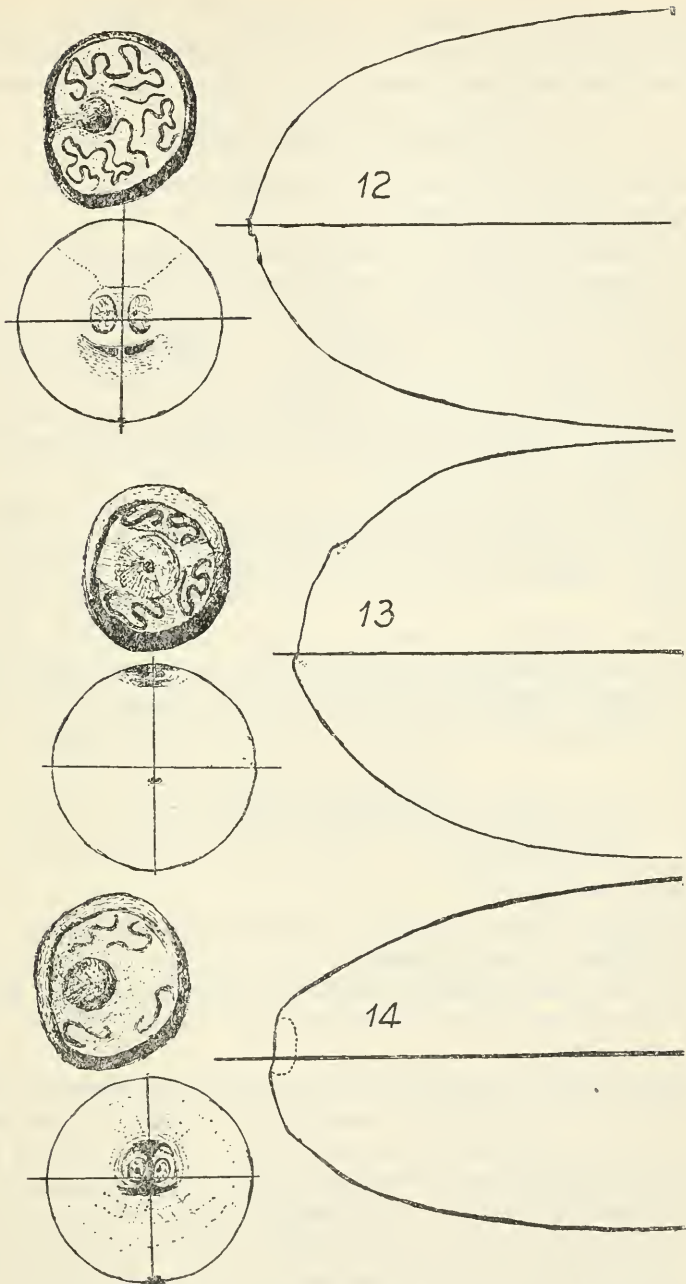
Piperi is exceedingly close to *schizurae* (Townsend) and can be separated from that species with difficulty. Nearest comparable in size is *anisotae* from which it is distinguished in the male by the densely and evenly ciliated hind tibiae without longer bristle, in female by its shorter and broader third antennal joint, narrow parafacials, and total absence of any strong bristles outside of the frontal row.

Townsend²² placed *Sturmia schizurae* Coquillett, in *Argyrophyllax* Brauer and Bergenstamm.

The specific name was preoccupied by *Argyrophyllax schizurae* Townsend, so he gave it a new name, *piperi*. According to Walton,²³ Townsend was mistaken in referring *schizurae* Coquillett to *Argyrophyllax* and this is obvious from a study of the type description. Some of the principal characters of the genus *Argyrophyllax* are the absence of ocellar bristles, the narrow cheeks, and weakly ciliated facialia, and as *schizurae* Coquillett has not these characters, it can hardly be an *Argyrophyllax* and is referred by the writer to *Achaetoneura*. Since the name *schizurae* is preoccupied in *Achaetoneura*,

²² Smiths. Misc. Colls. No. 1803, p. 98, 1908.

²³ Proc. Ent. Soc. Wash., vol. 18, p. 189-192, 1916.



FIGURES 12, 13, AND 14.—12, *ACHAETONEURA FRENCHII* (WILLISTON), PUPARIUM FROM SIDE AND END AND RIGHT SPIRACULAR PLATE MORE HIGHLY MAGNIFIED. 13, *A. EUCHAETIAE*, NEW SPECIES, SAME VIEWS AS IN FIGURE 12. 14, *A. SAMIAE*, NEW SPECIES, SAME VIEWS AS IN FIGURE 12

Townsend's name of *piperi* is retained for Coquillett's *schizurae*. Aldrich failed to note that *schizurae* (Townsend) 1891 is also an *Achaetoneura*, hence he regarded the new name *piperi* unnecessary.

16. ACHAETONEURA RILEYI (Williston)

Masicera rileyi WILLISTON, Scudder's Butterflies of New England, vol. 3, p. 1924, pl. 89, figs. 22-24, 1889.

Front of male at vertex 0.31 to 0.29, at widest part 0.41 to 0.39, in female at vertex 0.32 to 0.33, at widest part 0.40 to 0.41 the head width. In quite a few specimens there appears to be little or no difference in the width of the front as regards sex. Front and face cinereous; inner eye margins moderately divergent. Antennae in both sexes about three-fourths the length of the face; second joint yellowish, a little less than one-half the length of the third, the latter black; bucca one-fifth the head height.

Thorax black, gray pollinose; the chaetotaxy as in *frenchii*; scutellum with four pairs of marginal bristles besides the apical ones, the bristles nearest the suture and those nearest the apical pair strongest.

Abdomen brownish in most part with a well-marked black dorsal vitta. Bases of last three segments with narrow borders of light grayish pollen. Usually the first and second segments are destitute of macrochaetae but sometimes a weak pair are present on segment 2.

Mid tibiae with one strong bristle on the outer front side near middle. Hind tibiae evenly ciliated without a longer bristle.

Wing venation normal.

Length, 7-8 mm.

Redescribed from a number of specimens of both sexes at the United States National Museum.

The species was originally described by Williston from material (both sexes) reared by C. W. Riley, from *Papilio thoas* Linnaeus, locality not given.

Coquillett²⁴ had considered *rileyi* as a synonym of *irrequieta* Walker but later, in his manuscript notes, regarded the two as distinct. Aldrich²⁵ also regarded them as distinct. At the United States National Museum the species was placed in *Thysanomyia* Brauer and Bergenstamm, presumably by Townsend, but as the type of that genus, *Brachycoma fimbriata* v. d. Wulp, has the vibrissae well above the oral margin and other differences also, *rileyi* certainly can not be of that genus and is best regarded as an *Achaetoneura*.

²⁴ Revision N. A. Tachinidae, p. 108, 1897.

²⁵ Cat. Dipt., p. 463, 1905.

17. *ACHAETONEURA LANIIFERAE*, new species

Front of male at vertex 0.28, at widest part 0.43, in female at vertex 0.32, at widest part 0.42 of the head width; front and face golden pollinose. Inner eye margins divergent, the eyes widely separated below. Antennae in both sexes three-fourths length of face; second joint yellowish, about one-half as long as third, the latter black; bucca one-fifth the eye height.

Thorax black, gray pollinose, the chaetotaxy as in *frenchii*; scutellum brownish, bearing four pairs of marginal bristles besides a weak apical pair; the bristles nearest the suture and those nearest the apical pair strongest.

Abdomen more or less brownish in ground color, thinly grayish pollinose, the anal segment yellowish or yellowish brown, gray pollinose. No vitta or definite pattern obvious along the dorsum, first and second segments with weak marginal bristles scarcely distinguishable from the adjacent hairs. Abdominal hairs depressed.

Mid tibiae with one strong bristle on the outer front side near middle. Hind tibiae evenly ciliated without a longer bristle.

Wings with normal venation.

Length, 8-9 mm.

Described from a specimen of each sex reared from a cocoon of *Laniifera cyclades*, collected January 1, 1927, the flies issuing May, 1927. Both specimens are labeled, "51." Locality: Mexico.

Type.—Male. Cat. No. 43056, U.S.N.M.

18. *ACHAETONEURA FERRUGINEA* (Reinhard)

Frontina ferruginea REINHARD, Ent. News, vol. 35, p. 269, 1924.

Front at vertex about one-third head width, cinereous, face silvery white, slightly receding, facialia bristly three-fourths way in male, slightly less so in female; bucca narrow, about one-fifth the eye height. Antennae black, as long as face, third joint in male six or seven, and in female five or six times longer than the abbreviated second.

Thorax black, gray pollinose, the chaetotaxy as in *frenchii*; scutellum with three pairs of marginal bristles besides the cruciate apical pair.

Abdomen slender, reddish yellow, with a well defined black dorsal vitta; all segments with marginal bristles, those of the anal segment being equal in size to those of the third.

Legs black, basal joints sometimes yellowish. Mid tibiae with one long and one small bristle above it on outer front side; hind

tibiae evenly ciliate with one longer bristle. Front pulvilli of male less than length of the last tarsal joint.

Wings with normal venation.

Length, 5-7 mm.

Distribution.—College Station, Texas.

The species is readily recognized from Reinhard's fine description. *A. testacea*, which it most closely resembles, has a narrower front, third antennal joint shorter, and other differences.

19. *ACHAETONEURA SPECTABILIS* (Aldrich)

Frontina spectabilis ALDRICH, *Canad. Ent.*, vol. 48, p. 21, 1916.

This species is the only one of the *Achaetoneuras* that is clothed with dense golden pollen. Although Aldrich described only the female, the species can be readily recognized from his description.

Front in male 0.29, in female 0.33 the head width, golden pollinose, the vitta brownish; face silvery, third antennal joint in male six times and in female four times the length of the second; facial ridges bristly one-half way.

Thorax black in ground color with heavy golden pollen, bearing four dorso-central and usually three sternopleural bristles; scutellum with three pairs of marginal bristles besides the apical cruciate pair.

Abdomen black, golden pollinose, the narrow apices of segments two, three and four shining black, first segment usually without marginal bristles, second with or without a marginal pair, third with a marginal row, the fourth with a strong submarginal row.

Legs black, sometimes brownish; mid tibiae with one long bristle on outer front side, hind tibiae evenly ciliate with one longer bristle.

Wings with normal venation.

Length, 6-7 mm.

Distribution.—Ontario and Massachusetts.

The type specimen is deposited in the Canadian National Museum and has not been seen by the author. The brief description given herein is from material of both sexes determined by Aldrich.

Disposal of species not otherwise accounted for which have, at one time or another, been referred to *Frontina* or *Achaetoneura*:

acroglossoides TOWNSEND (*Frontina*), *Trans. Amer. Ent. Soc.*, vol. 18, p. 367, 1891.

Synonymous with *Chaetogaedia analis* v. d. Wulp.

americana BIGOT (*Prosopea*), *Ann. Ent. Soc. France*, p. 260, 1888, Mexico.

According to Aldrich (*Cat. Dipt.*, p. 462; 1905) *Prosperyea contigua* v. d. Wulp (*Biologia, Dipt.*, vol. 2, p. 120, Morelos, Mex.) is synonymous with *americana*. The species is unknown to the writer.

ancilla WALKER (*Tachina*), Insecta Saundersiana, vol. 1, p. 299, 1856.

Austen (Ann. and Mag. Nat. Hist., ser. 7, vol. 19, p. 337, 1907) believes that *T. ancilla* is correctly referred to *Frontina* by Coquillett, Townsend, (Proc. Ent. Soc. Wash., vol. 20, no. 1, p. 21, 1918) has apparently seen Walker's *ancilla* and considers it a *Pseudomyoethyria*.

ancilla COQUILLET (*Frontina*), Revision of N. A. Tachinidae, p. 106, 1897.

For Coquillett's species, misidentified as *F. ancilla* Walker, Townsend (Proc. Ent. Soc. Wash., vol. 20, No. 1, p. 21, 1918), erected a new genus and species, *Frontiniella parancilla* (by misprint *pararcilla*) which appears to have good standing.

anonyma RILEY (*Tachina*), 4th Rept. Ent. Mo., p. 129, 1872.

For the sake of reference. Doctor Riley provisionally used this name for a fly that he reared from *Telea polyphemus*. No recognizable description or figure was given. It was also mentioned by Riley that this same species has been reared from a number of different hosts.

In his later Reports on the Insects of Missouri, 5th, pp. 133-139, 1873; 7th, p. 178, 1875; 8th, p. 179, 1876; also in the First Report of the U. S. Entomological Commission, p. 323, 1878, reference is again made to *anonyma* with additional new host species. In the United States National Museum there are some of Riley's specimens bred from *Caloptenus spretus* Thomas and *Oedipoda carolina* Linnaeus, and which are perhaps what he considered *anonyma*. So far as these specimens are concerned I am unable to separate them from material reared from *Datana angusii* Grote and which in this paper is considered to belong to the *frenchii* complex. There is no assurance, however, that they are the same as *anonyma*, and in that the proposed type specimen can not be located or the species positively identified it is best left unrecognized.

apicalis v. d. WULP (*Prosphecrisa*), Biologia, Dipt., vol. 2, p. 122, 1890, Mexico.

Assigned to *Prosphecrisa* by the describer but referred to *Achaetoneura* by Brauer and Bergenstamm (Zweif. Kais. Mus. Wien, pt. 5, pp. 334 and 401, 1891). Unrecognized.

armigera COQUILLET (*Tachina*). Insect Life, vol. 1, p. 332, 1889.

The presence of infra-squamal setulae, the female with ventral abdominal keel armed with spines and with a sharp plicer are characters which exclude it from *Achaetoneura*. Townsend (Ann. Ent. Soc. Amer., vol. 2, p. 249, 1909) makes *armigera* Coquillett the type of his new genus *Eucelatoria*. Curran (Can. Ent., vol. 59, p. 12, 1927) refers the species to *Lydella*.

barbatula v. d. WULP (*Brachycoma*), Biologia, Dipt., vol. 2, p. 98, 1890, Mexico.

Assigned to *Brachycoma* by describer but referred to *Achaetoneura* by Brauer and Bergenstamm (Zweif. Kais. Mus. Wien, pt. 5, pp. 334 and 401, 1891). Unrecognized.

bigeminata CURRAN (*Frontina*), Amer. Mus. Novit., No. 260, p. 9, 1927.

The species has not been seen by the writer but from its description it can be excluded from *Achaetoneura* as defined herein by the following characters: Strongly receding face, weak ocellars, black palpi, narrow parafacials, and different chaetotaxy. Provisionally, the species is referred to *Masicera* of Coquillett's Revision.

chrysoyagata BIGOT (*Frontina*), Ann. Ent. Soc. France, p. 84, 1888, Mexico.—Brauer, Sitzungsbericht d. k. Akad., vol. 106, p. 28, 1897.

According to Aldrich (Cat. Dipt., p. 463, 1905) the types are a mixture of two species, of which the specimen corresponding to the description has no locality label. The species is unrecognized.

dubia WILLISTON (*Masicera*), Scudder's Butterflies of New England, vol. 3, p. 1924, 1889.

Coquillett (Revision of N. A. Tachinidae, p. 108, 1897) considered *dubia* synonymous with *violenta* Walker but Aldrich (Cat. Dipt., p. 463, 1905) does not agree, believing it to be distinct. The species was bred by Riley from *Vanessa antiopa* Linnaeus and from *Pholus (Philampelus) vitis* Linnaeus by Pergande. West (N. Y. List of Insects, p. 815, 1926) lists *dubia* from New York. The type is apparently lost. The species is unrecognized.

dydas WALKER (*Tachina*), Walker's List Dipt. Insects, pt. 4, p. 748, 1849.

According to Austen (Ann. and Mag. Nat. Hist., ser. 7, vol. 19, p. 336, 1907), *dydas* Walker equals *Eutachina rustica* Meigen.

fernaldi WILLISTON (*Achaetoneura*). In Forbush and Fernald's "The Gipsy Moth," Mass. Board of Agriculture, p. 387, 1896.

Assigned to *Achaetoneura* by describer. Coquillett (Revision of N. A. Tachinidae, p. 119, 1897) correctly places this species as a synonym of *Tachina mella* Walker.

flavicauda RILEY (*Exorista*), Riley's Second Report, Insects Missouri, p. 51, 1870, reared from *Leucania unipuncta*. Townsend (Trans. Amer. Ent. Soc., vol. 18, p. 364, 1891, and Psyche, vol. 7, p. 330, 1896) refers this species to *Frontina*. Coquillett (Revision of N. A. Tachinidae, p. 84, 1897) and Aldrich (Cat. Dipt., p. 450, 1905) correctly place the species as a synonym of *Bclvosia unifasciata* Desvoidy.

fulvipalpis BIGOT (*Masicera*), Ann. Ent. Soc. France, p. 263, 1888, Rocky Mountains.—BRAUER, Sitzungsbericht d. k. Akad., vol. 106, p. 340, 1897, gen. ref. from type. Unrecognized.

insularis BRAUER and BERGENSTAMM (*Prospaea*), Zweif. Kais. Mus. Wien, pt. 5, p. 334, 1891, St. Thomas, W. I.

Placed in *Prospalaea*, new genus, by Aldrich (Ann. Ent. Soc. Amer., vol. 18, p. 111, 1925).

irrequieta WALKER (*Tachina*), Walker's List Dipt. Insects, vol. 4, p. 789, 1849.

Coquillett (Revision of N. A. Tachinidae, p. 108, 1897) recognized this species in material bred from *Papilio thoas* Linnaeus from Jacksonville, Fla. He also considered *Masicera rileyi* Williston as synonymous with it. Aldrich (Cat. Dipt., p. 463, 1905) did not agree with Coquillett, holding that *rileyi* was distinct and that Walker's species was unrecognizable.

Aldrich's view is in accord with that of the present author.

lata WIEDMANN (*Tachina*), Auss. Zweifl., vol. 2, p. 322, 1830.

Assigned to *Achaetoneura* by Brauer and Bergenstamm (Zweif. Kais. Mus. Wien, pt. 5, p. 334, 1891). Aldrich (Proc. U. S. Nat. Mus., No. 2703, vol. 72, art. 7, p. 8, 1927) has studied the type and found characters that would exclude it from *Achaetoneura*. Referred to *Frontina*.

rubentis COQUILLET (*Achaetoneura*), Proc. Acad. Nat. Sci. Phila., p. 310, 1895.

Placed in *Frontina* by Coquillett (Revision of N. A. Tachinidae, p. 106, 1897). The different chaetotaxy, female with ventral abdominal keel armed with spines and with a sharp piercer, are characters which exclude it from *Achaetoneura*. Provisionally referred to *Lydella* by the writer.

rufifrons ROEDER (*Frontina*), Stett. Ent. Zeit., p. 346, 1885, Porto Rico.

The species is unrecognized.

rufostylata BIGOT (*Frontina*), Ann. Ent. Soc. France, p. 83, 1888, Mexico.

Aldrich (Cat. Dipt., p. 468, 1905) refers the species to *Prospherysa*.

setipes COQUILLET (*Frontina*), Proc. U. S. National Museum, vol. 25, No. 1280, p. 112, 1902.

Provisionally placed in *Prosopalaea* Aldrich by Aldrich (Ann. Ent. Soc. Amer., vol. 18, p. 111, 1925).

sphingivora TOWNSEND (*Masicera*), Trans. Amer. Ent. Soc., vol. 19, p. 286, 1892.

Coquillett (Revision of N. A. Tachinidae, p. 108, 1897) believes that it is synonymous with *violenta* Walker. Aldrich (Cat. Dipt., p. 463, 1905) disagrees with Coquillett and makes *sphingivora* a synonym of *dubia* Williston. The type has not been seen by the writer, although, from its description, the species would fall in the *frenchii* complex.

tenthredinidarum TOWNSEND (*Masicera*), Trans. Amer. Ent. Soc., vol. 19, p. 285, 1892.

Coquillett, in errata attached to revised index to Revision of N. A. Tachinidae, refers this species to *Frontina*. Aldrich (Proc. Ent. Soc. Wash., vol. 32, 1930, p. 25) shows that it is a synonym of the European *Ptychomyia selecta* Meigen.

violenta WALKER (*Tachina*), List of Dipterous Insects, pt. 4, p. 788, 1849.

Aldrich has seen the type and places it in *Tachinomyia*.

Coquillett's species is here described as *testacea*, new species.

xychus WALKER (*Ophelia*), Walker's List Dipt. Ins., vol. 4, p. 770, 1849, Jamaica.

According to Austen (Ann. and Mag. Hist., ser. 7, vol. 19, p. 332, 1907), *xychus* is a *Frontina*. The species is not recognizable from its description.