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(DIPTERA, SYRPHIDAE)

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VOLUME 94 : ARTICLE 6      NEW YORK : 1950





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Volume 94, article 6, pages 299–402, text figures 1–173,  
table 1, map 1, diagram 1

*Issued March 1, 1950*

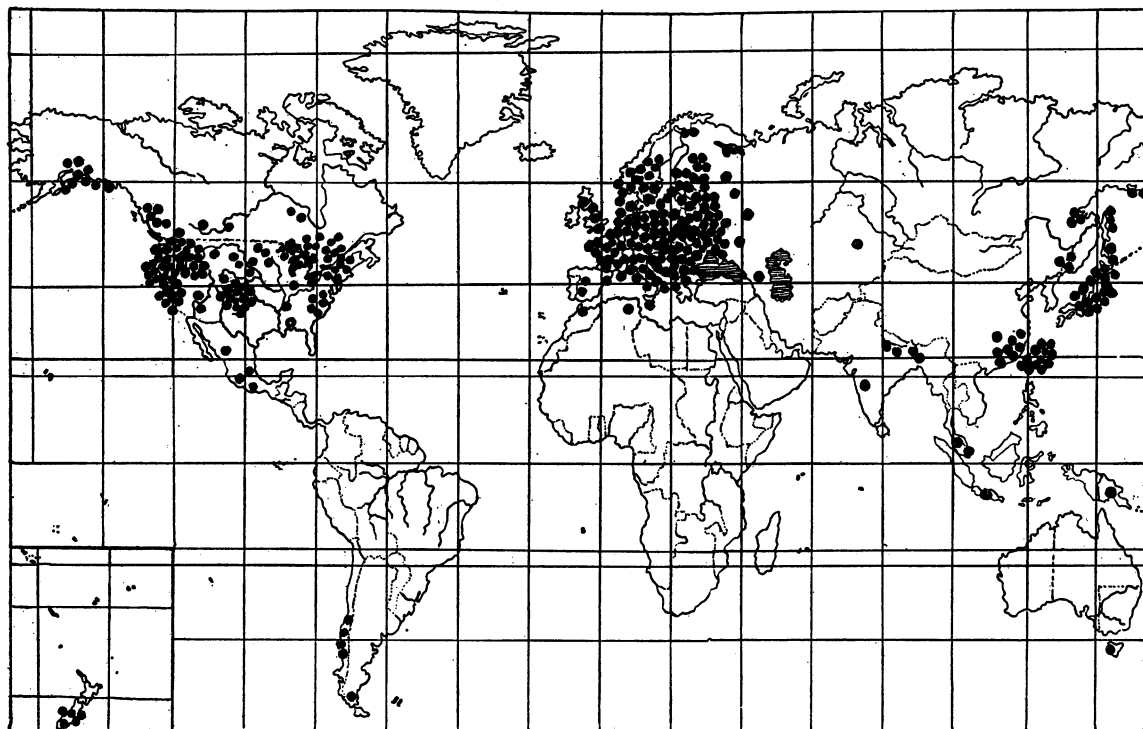
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## INTRODUCTION

THE GENUS *Cheilosia* Meigen constitutes one of the largest groups of recent syrphid flies. At least 324 species have been described by 49 authors. At present the greatest number of species occurs in northern Europe, but many species are found in North America, and the genus seems to be predominantly Holarctic in distribution. They range, however, into China, Japan, India, New Zealand, and a few are found in Chile. The species from these last two localities appear slightly atypical,

studied the North American species of *Cheilosia* with the purpose of preparing a careful, illustrated review of these members of our syrphid fauna. Each had independently begun such a study when it was decided to merge these efforts. The labor and responsibility of the undertaking have been shared upon as nearly equal a basis as it has been possible to achieve. This joint publication comprises a complete revision of the four North American subgenera: *Cheilosia*, *sensu*



MAP. 1. The distribution of the *Cheilosia* species of the world, based upon the approximate type localities of the known species.

at least as compared with other present-day forms. The flies appear to be wholly absent from Ethiopia.<sup>1</sup> Recent studies of fossil syrphids show that numerous species were present in northern Europe during Oligocene times. In this paper the world distribution of the known species is shown in map 1.

For several years the authors have jointly

*stricto*, *Chilomyia* Shannon, *Cartosyrphus* Bigot, and *Hiatomyia* Shannon. The subgenera *Cheilosia* and *Hiatomyia* are treated in the present paper; the subgenera *Chilomyia* and *Cartosyrphus* have been discussed elsewhere.<sup>2</sup>

The flies of the genus *Cheilosia* have few

<sup>1</sup> *Chilosia pedunculata* Bigot (in Thompson, 1858, Archives Entomologiques, vol. 2, p. 366) from Gabon evidently belongs elsewhere.

<sup>2</sup> Fluke and Hull, 1946, "Syrphid flies of the genus *Cheilosia*, subgenus *Chilomyia* in North America (Part II)," Trans. Wisconsin Acad. Sci., Arts, Letters, vol. 36, pp. 327-347; 1947, "The *Cartosyrphus* flies of North America (*Syrphidae*)," *ibid.*, vol. 37, pp. 221-263.

outstanding characters and, because of close similarity of many species, present great difficulties in specific characterization. They have long presented a problem in identification, the more so because many species have not yet received names. Hunter, Lovett, Shannon, and Curran have added numerous species in recent years (21 species to *Cheilosia*, *sensu stricto*, alone) to the older species, and this paper adds 30 more species in the restricted group, besides others in other subgenera. Perhaps many more species still await discovery. In 1922, Shannon began a very helpful revision of the genus which was unfortunately never completed. The European species were carefully monographed and thoroughly illustrated by Becker in 1894.

Because of the presence of a certain amount of specific variation, especially in the tuberculate elevation of the face, the student of this group will do well to proceed carefully before concluding that he has discovered new species. Particularly is the tuberculate elevation variable in *Hiatomyia*.

The imagines are rather weak flies and frequent blossoms in meadows, beside lakes and streams, or in or beside woods; they are easily captured. They are especially abundant in alpine regions, and both authors have collected them extensively in the west in the mountains of Colorado and Washington. The larvae are said in Europe to bore into the pithy stems of Compositae, and in this country one or more species cause the black check rot of hemlock and fir on the north-western coast.

Text figures 1 through 173 were drawn with the aid of the camera lucida, with the exception of figures 40, 41, 42, 43, 45, 46, 137, and 138 which are free-hand drawings from the types. The figures are, for the most part, drawn to scale. For the illustrations of wings, data concerning the presence of radial sector bristles are lacking for the species shown in figures 92, 93, 95, 97, 103, 122, and 173. Data on the presence of pubescence upon the facial strips are lacking for the specimens in figures 15, 24, 37, 123, and 139. It is sometimes impossible to determine

whether or not there is a complete circlet of spines upon the outer surface of the apical end of the second antennal segment. This is usually owing to the position in which the antennae have become fixed upon the type specimens. Such data are unavailable for the following figures: 15, 17, 24, 26, 29, 31, 42, 44, 46, 123, 134, and 139. With respect to the figures of wings, shading has been shown only in those species where it is particularly marked.

In this paper, the repositories of specimens in various institutions and collections (except those of the authors) are referred to as follows:

- A.M.N.H., the American Museum of Natural History
- B.M.N.H., British Museum (Natural History)
- C.A.S., California Academy of Sciences
- C.N.C., Canadian National Collection, Ottawa
- C.S.C., Colorado State College
- C.U., Cornell University
- M.C.Z., Museum of Comparative Zoölogy, Harvard College
- O.S.U., Ohio State University
- U.I., University of Illinois
- U.M., University of Minnesota
- U.S.N.M., United States National Museum

The authors wish to acknowledge the generous assistance of numerous individuals and institutions. Dr. C. H. Curran submitted several interesting, undescribed species. Prof. Nathan Banks of the Museum of Comparative Zoölogy and Dr. E. A. Chapin and Mr. Charles T. Greene of the United States National Museum have all provided the fullest facilities for study of their material. The facilities of the British Museum (Natural History) enabled one of the authors to illustrate and redescribe certain older species not well known.

We are also indebted to the following for the loan of material or assistance in other ways: Dr. J. H. McDunnough, Messrs. A. R. Brooks, Randall Latta, J. Wilcox, Charles Martin, Charles Dreisbach, Drs. S. C. Scullen, Don C. Mote, and E. Gorton Linsley, Messrs. R. E. Rieder, George F. Knowlton, and H. Douglas Tate, and Dr. Henry Dietrich.



## SYSTEMATIC DESCRIPTIONS

### GENUS *CHEILOSIA* MEIGEN, SENSU LATO

*Cheilosis* MEIGEN, 1822, Systematische Beschreibung der bekannten Europäischen zweiflügeligen Insekten, vol. 3, p. 296.

*Endoiasimyia* BIGOT, 1882, Ann. Soc. Ent. France, ser. 6, vol. 2, p. 136.

*Cartosyrphus* BIGOT, 1883, Ann. Soc. Ent. France, ser. 6, vol. 3, p. 230.

*Chilosia* WILLISTON, 1884, Bull. U. S. Natl. Mus., no. 31, p. 35 (also other authors).

*Chilomyia* SHANNON, 1922, Insecutor Inscitiae Menstruus, vol. 10, p. 126.

*Hiatomyia* SHANNON, 1922, Insecutor Inscitiae Menstruus, vol. 10, p. 126.

*Taeniochilosia* OLDENBERG, 1916, Wiener Ent. Zeitg., vol. 35, p. 101.

*Sonanomyia* SHIRAKI, 1930, Mem. Faculty Sci. Agr. Taihoku Imp. Univ., vol. 1, p. 320.

*Chaetochilosia* ENDERLEIN, 1936, Die Tierwelt Mitteleuropas, vol. 6, pt. 16, p. 125.

*Dasychilosia* ENDERLEIN, 1936, Die Tierwelt Mitteleuropas, vol. 6, pt. 16, p. 125.

Flies of dark and somber color but occasionally shining blue or brassy black, though never with pale markings except in certain Chilean species and except for obscure yellow areas in two Nearctic species. Size ranging from 5 mm. to 15 mm. Head: eyes of male holoptic, pilose, or bare. Front wide in female and often shallowly sulcate or linearly grooved, or micropunctate or granulate. The antennae are short, and the third joint is short oval. The arista is bare, pubescent, or plumose. Sensoria are often well developed. The face is always tuberculate in both sexes and may be of several types with respect to tubercle and may also vary considerably in prominence. The face has well-marked, lateral, eye-marginal, strip-like areas set off from the remainder of the face by creases. The face is usually more or less pubescent (micropilose) and in a few species sparsely hairy as well. Thorax with no outstanding characters, rarely vittate, always obscurely. Scutellum with or without bristles. Legs: the hind femora vary from moderately thickened (evenly distributed) to slender. Wings hyaline to pale smoky or yellowish; the subapical cross vein joins the third vein near the wing apex as a rule. The anterior cross vein lies definitely before the middle of the discal cell.

The third longitudinal vein is nearly straight. Abdomen from long to short oval, shining or dull. Species characters concern chiefly the color and character and color of the pile.

There have been several attempts to split up as large an assemblage of species as this. The following groups are viewed by the authors as valid subgenera.

*Cheilosis* Meigen (genotype *flavipes* Panzer, a European species). The species remaining in *Cheilosis* are those that have pilose eyes and bare face (except pubescence) and with arista bare or pubescent. The majority of recent species fall here. Several species groups can be recognized. There are those with wide, deep, subconate face, typified by *ferruginea*, and those with spurred or angulate front coxae, typified by *aldrichi*. We do not recognize *Chaetochilosia* Enderlein, genotype *maculata* Fällén, nor *Dasychilosia* Enderlein, genotype *variabilis* Panzer.

*Cartosyrphus* Bigot (subgenotype *pagana* Meigen, a European species). Here lies the group of species with bare eyes. They are numerous in North America, particularly in the eastern states and Canada, almost absent in the western United States, but numerous in Europe.

*Hiatomyia* Shannon (subgenotype *willistoni* Snow, an American species). Shannon erected this subgenus for those species of *Cartosyrphus* with a plumose arista. A number of species fall here, and the division seems well warranted. *Hiatomyia* is a well-marked, rather distinctive group and characteristically American. It is related to the Asiatic genus *Endoiasimyia* Bigot.

*Endoiasimyia* Bigot (genotype *indiana* Bigot, an Indian species). The authors compared American species of *Hiatomyia* with the types of Bigot's *Endoiasimyia* (genotype *indiana* Bigot) in the British Museum (Natural History). The only distinction whatever lies in the fact that *Endoiasimyia* has well-developed pile upon the eyes. This is as great a distinction as lies between *Cartosyrphus* and *Cheilosis*, and is moreover a logical one. *Endoiasimyia* and *Hiatomyia* would then deserve recognition upon a parity basis. They are further separated geographically. This represents a reversed view of the validity

of *Endoiasimyia* by Hull. It should be here pointed out that *Sonanomyia* Shiraki (genotype *formosana* Shiraki, a Formosan species, monotypic) is an exact equivalent of *Endoiasimyia*, that is, it is a *Cheilosia* with hairy eyes and strongly plumose arista. Shiraki is mistaken in assuming such a close relationship of *Sonanomyia* to *Volucella*, though there are definite indications of affinities between the two respective subfamilies. Shiraki gave quite careful and complete figures of his species.

*Taeniocheilosia* Oldenberg (subgenotype *atriseta* Oldenberg, a European species, monotypic). This fly is perhaps related to *Hiatomyia* but is so distinct in the long, thick, and short pubescent arista, in which the pubescence reaches to the apex, that it is retained in this study. However, because of the peculiar situation of the arista upon the third segment, it may be that this fly is a very aberrant member of the Pelecocerinae instead of the Cheilosinae. It reminds one of acalyptrate genera like *Tetanocera* and *Pachycerina*. It is not known at present from the North American fauna, although it is approached by *Hiatomyia signatiseta* Hunter.

*Chilomyia* Shannon (subgenotype *occidentalis* Williston, an American species). Shannon erected this subgenus to contain those species of *Cheilosia* with pilose face as well as eyes. A number of our species fall here, but the group is weakly defined, and indeed facial pile may be present in some cases on one sex only. It is perhaps only a species group but is employed here as forming a useful basis of subdivision. A number of European species fall into this category.

*Chromocheilosia*, new subgenus (genotype *bicolor* Shannon and Aubertin, a Chilean species). This name is presented for those truly aberrant antipodeal *Cheilosiae*, of which there are several species, that are in large part bright, pale orange in color. These may be antiquated types, but because of the real scarcity of colored forms in a group containing so many species, which are moreover geographically isolated, this separation is considered warranted. Of species in the Northern Hemisphere, so far known, only *maculata* Fällén of Europe (gray pollinose markings) and two or three North American species (with obscure luteus markings) are marked.

*Stenocheilosia* Matsumura (genotype *isshiki*, a Japanese species) is not known to the authors, nor was Shiraki familiar with it. Its position therefore with respect to these other groups cannot be stated.

Thus from the above list three groups are, for this study, extraterritorial: *Taeniocheilosia*, *Endoiasimyia*, and *Chromocheilosia*.

On the North American continent the flies of the subgenera *Cheilosia* and *Hiatomyia* are predominantly western in their distribution. Only one species of *Hiatomyia* is known for certain from the eastern states, and of 62 species of *Cheilosia*, only four species of these hairy-eyed, bare-faced forms are so far found in the eastern states. There are one or two species known from Ohio and Wisconsin. There is a small group known from such states as Nebraska and South Dakota and Minnesota. Future collecting may extend the range of this group. There is a larger group of species from Colorado, at least some of which extend on to the northwest or have close relatives there. The largest group of species is found in the northwestern states including British Columbia. Five species are known from Alaska and three from Mexico.

Forty-one species are known from males; 16 from males only. Forty-six species are known from females; 21 from females only. Twenty-five species are known from males and females. Of the 33 older species of *Cheilosia*, *sensu stricto*, the authors have seen the types or paratypes of 22, besides homotypes of two others.

The authors have been unable to find the location of the types of the seven species described by Hunter. Correspondence with officials at the departments of entomology at the universities of California, Nebraska, and Kansas, as well as with the custodians of the collections at the California Academy of Sciences, the United States National Museum, the American Museum of Natural History, the Museum of Comparative Zoölogy, and the Canadian National Collection, show that these officials disclaimed possession of these types. Some of his types are at the University of Nebraska, but not these, it is stated. Hence they may very well be lost.

There were eight new species named and keyed by Shannon which he did not describe; hence no type data were given. In this paper



the type data as given for these species are from the specimens that Shannon studied. These types are in the United States National Museum collection.

One species of *Cheilosia* should, we think, be removed from the North American list. This is *Chilosia skinneri* Johnson from New

stance, to take into account sexual differences or to describe the degree to which the pilosity of the body is erect, or appressed; it may lie completely flat upon the surface in part in many species. The following discussion of terms, some of which are illustrated in diagram 1, may be appropriate:

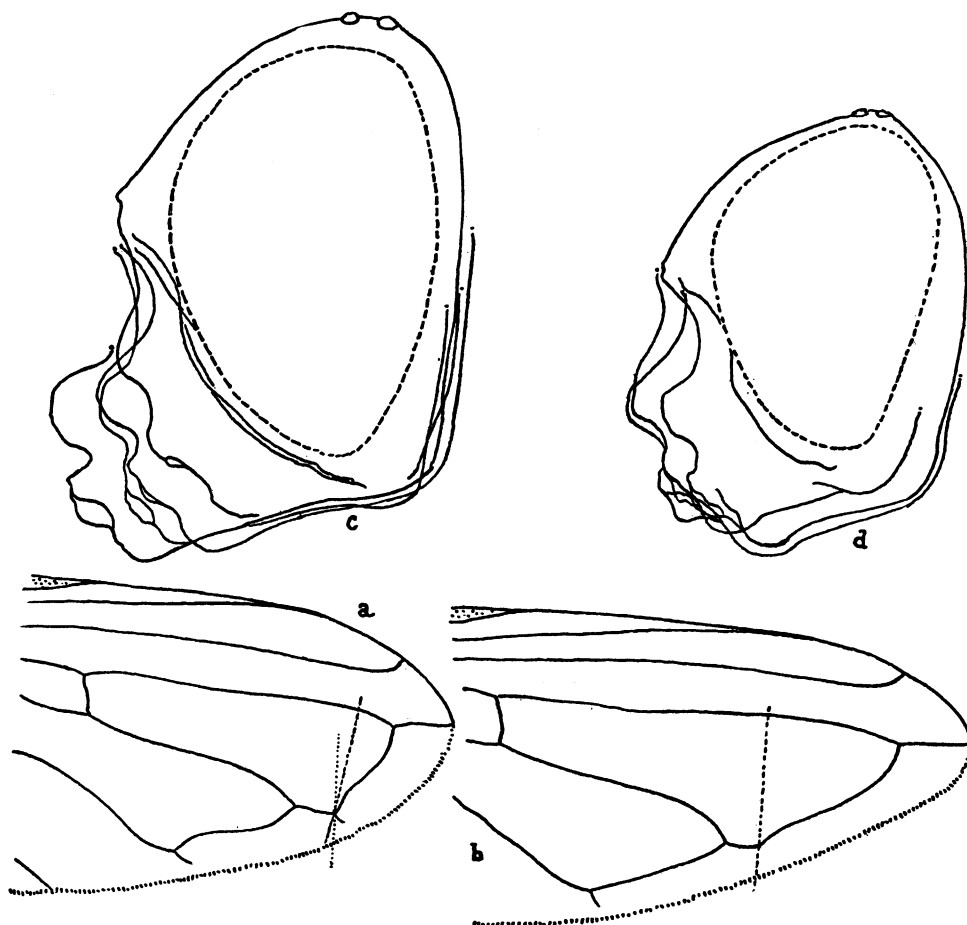


DIAGRAM 1. A, B. Wings of *Cheilosia* species, showing the method of delimiting the distal section of the first posterior cell. C, D. Lateral views of the head of several *Cheilosia* species, showing some of the types of face and comparative contours and development of face, tubercle, concavity, epistoma, and occiput. Each has been drawn to the same eye scale, as shown by the broken ocular margin.

Mexico. The type studied appears to belong to *Chamaeosyrphus* and not *Cheilosia*.

In an extended treatment of any large and closely interrelated group of species it is frequently necessary to be more precise, to elaborate, or more carefully to define terminology. This study is no exception. Older descriptions almost uniformly fail, for in-

1. Tubercle of the face. All species in both sexes monotuberculate, except *aurotecta* which may possibly be bituberculate. The tubercle may be described as (a) low; (b) prominent; (c) abrupt above, meaning that the slope into a deep facial concavity is relatively sudden and steep; (d) abrupt below, the slope to the epistoma is sudden and steep; (e) nar-

row, determined from an anterior view of the face; (f) nasiform, above, the tubercle slants diagonally towards the antennae, the slope below the tubercle, however, being abrupt, the facial concavity almost absent; (g) paratuberculate, with small diagonal ridges on either side of the tubercle above, not prominent; (h) laterally creased, with a flattened area on either side similar to that commonly found in many species of *Volucella*; not marked.

2. Upper facial concavity (above). This is the one usually mentioned; it is either shallow or deep or almost wanting.

3. Lower facial concavity. This lies below the tubercle towards the epistoma; it is seldom marked.

4. Pubescence. Many authors refer to the minute pile common on face, especially below the antennae and sometimes on the front, or even on the femora, as pollen. Under the medium or high power of the binocular it may be seen as minute hairs. To the authors pollen is the submicroscopic dust or peculiar texture which, in *Cheilosia*, is found only in the vittae upon the mesonotum of a few species. It is common in *Helophilus* and *Temnostoma*.

5. Characters upon the front, vertex, and eyes: A. Lunate areas. These are elongate, slightly crescentic areas lying along the ocular margin and, in contrast to the front, are punctate and sometimes differently colored. B. Medial crease. This runs, if present, down the middle of the front. C. Transverse excavation. This lies upon the lower third of the front and is very shallow indeed or it may be replaced by a slight bulge. D. The vertex may be slightly but noticeably protuberant above the ocular margin. E. The eyes in males may bulge slightly where they meet. F. A few species may have rather strongly enlarged upper facets in the male. G. Granulations. These refer to the slight one-sided elevations at the bases of the hairs of many species.

6. Characters of the wings: A. Distal section of the first posterior cell. This is the remainder of this cell marked off by a line running through the end of the last section of the fourth vein (spur omitted), and the beginning of the subapical cross vein, and making an exact right angle with the third vein. The species of *Cheilosia* vary considerably in respect to this area but unfortunately, barring exact illustration, one may only refer to it as long or short. It varies moreover in

TABLE 1

A SCHEME OF DEVELOPMENT OF THE SUBGENERA AND SPECIES GROUPS  
OF *Cheilosia*

*Cheilosia* species with bare or micropubescent arista

Subgenus with eyes bare:

*Cartosyrphus*, bare-eyed ancestral forms, dating back to the Oligocene

Species groups:

1. Face bare (*tristis*, *comosa*, etc.)
2. Face pilose (*sialia*)

Subgenera with eyes pilose:

*Cheilosia*, *sensu stricto*, face bare or micropubescent

Species groups:

1. Facial concavity shallow, pile erect (*speculum*, *margarita*, etc.)
2. Facial concavity deep, pile erect (*meganosa*, etc.)
3. Facial concavity shallow, pile appressed (*appressa*)
4. Facial concavity deep, pile appressed (*sororia*, *pikoi*, etc.)
5. Large, erect pilose species with long shaggy pile; face deep, subconate, concavity shallow (*lasiophthalmus*, *ferruginea*)
6. Face greatly produced diagonally (*cratorhina*)

*Chilomyia*, face "hairy" or pilose

*Cheilosia* species with plumose arista

Subgenus with eyes pilose

*Endoiasimya*

Subgenera with eyes bare

*Hiatomyia*, arista loosely plumose

*Taeniochilosia*, arista densely, bushy plumose

the sexes as well as to a still greater extent between species or groups of species. Males, at least frequently, have the section considerably longer. B. Last section of the third vein. The length of this may be of interest, or the remoteness with which the cross vein joins the third vein. C. The angle formed by this cross vein with the pre-apical section of the third vein and whether a right angle, an acute angle, or greater than a right angle. The curvature of the third vein affects this. D. Shape of the subapical cross vein and whether sigmoid or nearly straight. E. Presence or absence of a spur at the base of the subapical cross vein.

In table 1 we have attempted to show some of the possible interrelationships of the species groups and subgenera, without claiming any finality for this interpretation.

#### KEY TO SPECIES OF *Cheilosia*, SENSU STRICTO

##### MALES

1. Head deeply produced, triangular from an anterior view. Large, shaggy flies, heavily erect pilose, usually more than 10 mm. in length . . . . . 2  
Head oval from the front; smaller species not unusually pilose; pile often partly decumbent . . . . . 15
2. Abdomen bright, shining blue or purplish black; wings fumose from end of basal cells outward; mesonotum usually with a conspicuous band of black pile across the middle; pile of third and fourth abdominal segments long and erect and black (California, Oregon) . . . . . *chalybescens* Williston  
Not strongly shining blue or purple. Pile of mesonotum almost always wholly pale; rarely with some black pile over wing and on notopleura; abdominal pile usually wholly pale; sometimes with some black hair mixed in on the fourth segment. . . . . 3
3. Frontal and ocellar pile black or black and golden mixed. Pile of mesonotum yellowish or golden with considerable black pile intermixed . . . . . 4  
Frontal pile always wholly pale, or, if partly black, the face is extraordinarily long and deep and the mesonotal pile bears a reddish tinge. Pile of mesonotum almost or quite wholly pale . . . . . 5
4. Frontal and ocellar pile wholly black; antennotubercle distance short, deeply concave; third antennal segment smaller than usual; mesonotum and scutellum with both black and yellow pile, the latter predominating.  
Post femora outside laterally with short, yellow pile in addition to the black, not longer than the thickness of the hind femora; hind tibiae conspicuously orange or reddish brown at base and apex. Abdominal pile usually wholly pale; fourth segment usually without post-marginal black hairs; wing veins dark brown; ocular pile black; pile of sternites pale (Oregon, Washington) . . . . . *hirsuta*, new species  
Frontal pile mixed black and pale and longer; mesonotum more brassy, with some golden hairs intermixed along the margin; tibiae pale at base only; wing veins distinctly yellow brown; ocular pile golden; face shallowly concave with low tubercle; pile of sternites longer, erect and black (Oregon) . . . . . *nigrovittata* Lovett
5. Face very long and deep. Frontal and ocellar pile mixed black and pale yellow; eye pile very long and black. Third antennal segment of normal size. Post femora outside laterally with long, shaggy, yellow pile in addition to black, twice as long as thickness of femora; hind tibiae light colored only at base; mesonotal, scutellar, and abdominal pile brownish yellow with a touch of reddish; fourth segment with occasionally a few black, post-marginal hairs (Oregon, Washington) . . . . . *ferruginea* Lovett  
Face shorter, less deep. Frontal, ocellar, and scutellar pile wholly pale; mesonotal pile wholly or almost wholly pale . . . . . 6
6. Pile of abdomen bicolored, yellow basally, black on the posterior part of the third segment, and wholly or almost wholly black on the fourth segment . . . . . 7  
Pile of abdomen wholly pale, or very rarely with a few black hairs on the posterior edge of the fourth segment . . . . . 10
7. Pteropleural pile and the facial strip pile, at least below, black. Ocular pile brown; third abdominal segment extensively black pilose on the posterior two-thirds or more; size 11 to 12 mm. . . . . *browni* Curran  
Pteropleural pile and facial strip pile and ocular pile pale yellow . . . . . 8
8. Third abdominal segment and all but the apex of the fourth, erect, pale yellow pilose (Oregon, Washington) . . . . . *seripila*, new species  
Third and fourth abdominal segments wholly or almost wholly erect, black pilose . . . . . 9
9. Hind tibiae orange brown at apex; tips of fore and mid tarsal segments reddish apically; apical part of first posterior cell moderately long, the cross vein forming less than a right angle with the third vein (Ontario, New Brunswick) . . . . . *nigroapicata* Curran

- Hind tibiae, wholly black except at base, pilose except medially and a few hairs ventrally; hind femora wholly black pilose laterally and dorsally on the apical half; fore and mid tarsal segments not reddish apically; apical portion of first posterior cell short, the cross vein forming a right angle with the pre-apical section of the third vein (Colorado) . . . *hiantha*, new species
10. Hind femora, tibiae, and hind basitarsi wholly golden pilose; last section of first posterior cell long; antennae and arista orange brown, face thickly and extensively long golden pubescent, third antennal segment slightly truncate; lower section of first posterior cell quite deep (Utah, Colorado, Oregon, Washington, Alaska) . . . *lasiophthalmus* Williston
- All these portions of the hind legs extensively black pilose, and with or without some golden pile; face pubescent or polished and bare; first posterior cell long or relatively short . . . . . 11
11. Small, polished, greenish black species with pale yellow pile; face polished black with little or no pubescence; hind femora ventrally with thick, black, stiff, setate pile throughout, and longer yellow pile basolaterally; hind tibiae with extensive black pile laterally and ventrally; hind basitarsi black pilose; first two antennal segments sepia, third orange, arista blackish (Utah, Oregon) . . . . . *hermiona*, new species
- Larger flies, often with brassy ground color, especially upon mesonotum and scutellum; face bare or pubescent. . . . . 12
12. Antennae black; third segment with obscure, narrow, reddish black apex; face polished black, nearly bare; hind femora thick black pilose throughout the ventral margin, their tibiae golden pilose except in the middle ventrally (New Hampshire) . . . . .
- . . . . . *rhinoprosopa*, new species
- Antennae pale . . . . . 13
13. Face thick yellow pubescent; arista blackish (Alaska) . . . . . *robusta* Hine
- Face black, polished, nearly bare; arista light orange brown (Washington) . . . . .
- . . . . . *atrocapilla*, new species
14. Mesonotum shining bronze, together with scutellum reddish yellow pilose, the latter without bristles; abdomen with semi-appressed thick golden pile, antennae light orange brown (Mexico) . . . *chrysochlamys* Williston
- Not such flies . . . . . 15
15. Dorsum of thorax yellow pilose, with a well-defined band of black pile across its middle; face occasionally with a few hairs; wings rather strongly infuscated (Oregon) . . . . .
- . . . . . *nigrovittata* Lovett
- Without such band of pile; face always completely bare except for its short pubescence . . . . . 16
16. Fore coxae bluntly to sharply angulated on the outer anterior corner and usually with a short and distinct but usually blunt spur. 17
- Fore coxae rounded, without blunt or sharp angle, and without spur . . . . . 21
17. Legs entirely black, sometimes with narrow bands of dark brown at base of anterior tibia or anterior tarsi . . . . . 20
- Legs in part yellowish or brownish; sometimes brown upon base and apex of tibiae . . . 18
18. Frontal pile entirely pale; mesonotal pile all yellow . . . . . 40
- Front and mesonotum at least partly black pilose . . . . . 19
19. Frontal pile almost entirely black; coxal spur more blunt. Considerable black pile on mesonotum, upper pleura, and scutellum . . . . . 41
- Frontal pile yellow and black mixed; coxal spur sharply pointed (Colorado, Utah) . . . . .
- . . . . . *pikiei* Shannon
20. Fore coxae bluntly rounded angulate, without spur; all pile of head, thorax, and all of abdomen save for a few appressed blackish hairs in the middle of third segment thick, erect, and whitish; base of anterior tibiae and extreme base of middle tibiae yellowish brown (British Columbia) . . . . .
- . . . . . *canada*, new species
- Fore coxae more strongly angulate; pile of front yellowish; some black pile about the ocelli and some upon the middle of the abdomen; legs black and black pilose. Shining black, nearly bare flies (Idaho) . . . . .
- . . . . . *aldrichi* Hunter
21. Legs wholly black and black pilose, at most the bases of the tarsi very dark brown; somewhat bare, short pilose species; wings smoky, blackish at base; mesonotal and pleural pile black (Massachusetts) . . . . .
- . . . . . *hiawatha* Shannon
- Legs in part yellowish or orange brown; sometimes medium brown on base and apex of tibiae . . . . . 22
22. Last abdominal segment with sparse, erect, black, bristly pile; scutellar margin with many black bristly hairs; abdomen with a banded appearance due partly to yellow pile in the anterior corners of third, fourth, and fifth segments, black pile elsewhere; mesonotum characteristically bronze brown, chiefly pale pilose; facial tubercle very broad, wholly white pubescent. Antennae in



- part brownish; frontal pile in part pale (South Dakota) . . . *dakota*, new species  
Not such flies . . . . . 23
23. General body color and especially the shining face blue black. Face from in front not greatly wider at oral margin than across the antennae. Third antennal segment clear orange on all except the dorsal rim; mesonotal and pleural pile erect, wholly black. 24  
Nowhere blue black; aeneous or brownish black, sometimes faintly greenish. Mesonotal and pleural pile never wholly black, at least largely pale. Third antennal segment orange below, sometimes wholly dark brown . . . . . 25
24. Wings hyaline (Alaska, British Columbia) . . . . . *alaskensis* Hunter  
Wings wholly uniformly dark yellowish brown (Oregon) . . . . . *alaskensis* Hunter *flavipennis*, new subspecies
25. Front with whitish or silvery pile; outside of hind tibiae chiefly or wholly pale pilose. 26  
Front black or brownish black pilose, at most with a very few straggly pale hairs; hind tibiae chiefly or wholly black pilose on the outer surface . . . . . 27
26. Front with yellow and brownish black pile intermixed; sides pale pubescent. Thoracic pile wholly pale; scutellum without bristles; tibiae almost wholly light, bright orange, with a faint trace of brown in the middle; sides of face and facial strips thickly pale pubescent, the latter pilose; abdominal pile wholly erect and pale. General color quite brassy (Idaho) . . . . . *florella* Shannon  
Not such flies . . . . . 37
27. Apex of scutellum with some marginal bristles or hairs that are definitely larger and stouter than those immediately behind upon the disc; these extra marginal bristles almost black . . . . . 28  
Scutellar margin and posterior part of disc with numerous long hairs of about equal thickness and length; scutellar pile almost wholly pale, but sometimes almost wholly black . . . . . 33
28. At least the posterior half of the abdominal fourth segment, and sometimes the third, with abundant black pile; at least the dorsal half of third antennal segment almost wholly orange brown. Some black pile on anterior half of mesonotum and disc of scutellum . . . . . 29  
Fourth abdominal segment wholly or almost wholly pale pilose or rarely with a few black hairs on exterior margin, or in the center of the third segment; third antennal segment sometimes orange, sometimes blackish . 30
29. Black pile extensive on second, third, and fourth segments; facial tubercle very broad, wide, and low, shining black and bare; facial strips narrow but silvery pubescent; length 8 mm. (Ontario, North Dakota, New England) . . . . . *orilliaensis* Curran  
Black pile bristles long and sparse, upon posterior half of fourth segment only; face densely pubescent, the tubercle large, conspicuous but not low and broad; large species, 10 mm. (Minnesota) . . . . . *minnesotensis* Telford
30. Scutellar discal pile wholly and anterior mesonotal pile almost wholly pale; antennae dark brown, almost black; size 5 to 6 mm. (Colorado, Alberta, Alaska) . . . . . *borealis* Coquillett  
Scutellar disc and usually the anterior mesonotum with more or less black pile mixed with pale; third antennal segment orange or light brown on at least the basal ventral half, sometimes wholly light colored . . 31
31. Face quite shallowly excavated below antennae; extreme anterior mesonotal pile exceptionally long, almost entirely blackish; hind tibiae narrowly dark brown at base and apex; wings weakly clouded with brown; third antennal segment small, light brownish red with blackish rim . . . . . 44  
Face moderately to deeply excavated; extreme anterior mesonotal pile quite short or of only moderate length, wholly golden in the middle or with a little black pile; hind tibiae sometimes bright at base and apex; wings with a brown cloud . . . . . 32
32. Anterior mesonotum with only golden pile in the middle; base and apex of hind tibiae light brown but dull; 8 to 11 mm. . . . 36  
Anterior mesonotum partly black pilose; base and apex of hind and mid tibiae bright orange brown; facial tubercle small, antennae small, the third segment wholly orange brown; rather robust, small, black flies, 8 mm. (Ontario, Alberta) . . . . . *nigrofasciata* Curran
33. Second and third abdominal segments with abundant, short, black pile in the middle; antennae black or reddish black; facial tubercle quite prominent though not large; robust, greenish black species, the bases of the tibiae dark brown . . . . . 39  
Not with these characteristics . . . . . 34
34. Face deeply excavated beneath antennae, the tubercle either low or prominent; bases and apices of tibiae brightly marked with brownish orange; second antennal segment and at least the third segment light orange . . 42  
Face quite shallowly or not at all excavated;

- the tubercle small and excavated, usually only on its lower side; bases and apices of tibiae dull brown; third antennal segment reddish, or dark brown to black, rarely with traces of orange about the basal ventral corner. . . . . 35
35. Scutellum with long black hairs on the margin, or almost wholly black pilose; third antennal segment reddish brown. . . . . 43  
Scutellar margin and mesonotum, save one or two hairs above wing base, and whole of abdomen yellowish or yellowish brown pilose; antennae wholly dark brown (Washington) . . . . . *margarita*, new species
36. Antennae small and entirely brownish black; facial tubercle small and narrow; ocular pile very dark brown (Idaho) . *florella* Shannon  
Antennae large or medium sized, third antennal segment orange on at least the basal half; tubercle quite large and round; ocular pile more or less silvery (Colorado, California, Oregon, Washington) . . . . .  
 . . . . . *baroni* Williston
37. Front bare or lightly pubescent, its pile long . . . . . 38  
Frontal pubescence completely obscuring the ground color; wings hyaline; greenish black or brown species, the moderately wide facial strips pubescent but not conspicuously so; facial tubercle broad and low; subapical cross vein barely sigmoid; mesonotum with exceptionally long and thick, delicate, pale yellow hairs (British Columbia) . . . . . *flavosericea*, new species
38. Front nearly bare of pubescence, paratuberculate; distal section of first posterior cell long, its cross vein long; mesonotal and scutellar pile pale yellow; hind basitarsal pile black above (Wisconsin) . . . . .  
 . . . . . *cynoprosopa*, new species  
Front lightly pubescent; not paratuberculate; distal section of first posterior cell shorter, the cross vein rather strongly sigmoid; thorax entirely white pilose except for two or three black hairs over wing; hind basitarsal pile golden above; wings with a faint brown cloud about middle; blue black species with extra wide, densely pubescent facial strips; facial tubercle small, black, but narrow and well formed (Ohio, Wisconsin) . . . . . *cineralis*, new species
39. Hind femora entirely black pilose laterally, their tibiae black pilose except medio-apically; first posterior cell shorter, its angle less wide; extra robust species; eyes bulging at line of junction; facial tubercle a little more pointed; third antennal segment wholly black; mesonotal pile more abundant and thick (Washington) . . . *obesa*, new species  
Hind femora with considerable golden pile laterally; hind tibiae golden pilose, at least in part, throughout the medial length; eyes not bulging at junction; facial tubercle shorter; third antennal segment reddish basally; mesonotal pile rather sparse; less robust species (Colorado) . . . . .  
 . . . . . *speculum*, new species
40. Apical half of third antennal segment blackish; the whole segment dark; pile of fourth abdominal segment only suberect (British Columbia) . . . . . *columbiae* Curran  
Only the narrow, apical margin of the third segment blackish; remainder of the segment orange; the pile of the fourth abdominal segment is quite flat-appressed, black in the middle (Idaho, Washington) . . . . . *decumbens*, new species
41. Fourth abdominal segment with flat-appressed, black pile in the middle; third longitudinal vein straight; last section of fourth vein shorter; wing paler brown (Washington) . . . . . *bigelowi* Curran  
Fourth abdominal segment with semi-erect, white pile in the middle; third vein strongly curved; last section of fourth vein longer; wing darker brown (California) . . . *bigelowi* Curran  
 . . . *callichroma*, new subspecies
42. Eyes continuously pilose, rather thickly pilose above (Minnesota, Washington) . . . . . *cottrelli* Telford  
Eyes quite sparsely pilose, the pile restricted to the upper half (Manitoba, Alberta) . . . . . *hunteri* Curran
43. Face not excavated above, sloping only gradually, and barely concave; pile of mesonotum and disc of scutellum long, fine, and almost wholly yellow; marginal bristles of scutellum long and fine and black; middle of third abdominal segment with considerable subappressed black pile (Colorado) . . . . . *montanipes*, new species  
Face gently excavated above; pile of mesonotum and disc of scutellum thick, erect, fine, rather long, and almost wholly black; third and fourth abdominal segments with erect or nearly erect, altogether pale yellow pile (Alaska) . . . . . *hesperia* Shannon
44. Ocular pile white, moderately sparse, but long; third antennal segment rather pale yellowish brown, except its narrow upper border; facial concavity nearly absent; stigma yellowish; mesonotal pile chiefly blackish (Colorado) . . . . . *pilosipes*, new species  
Ocular pile light brown, dense; third antennal segment brown, the base reddish; facial concavity shallow; stigma brown; mesonotal

pile chiefly brownish white (Colorado)  
 . . . . . *montanipes*, new species

## FEMALES

1. Head deeply produced downward, triangular from a frontal view; large flies, shaggy, heavily erect pilose, usually considerably more than 10 mm. in length . . . . . 2
- Head oval from the front, sometimes produced forward, not unusually pilose; pile often decumbent, occasionally flat appressed . . . . . 13
2. Arista shorter than width of front across antennae; wholly erect, wholly light, golden yellow pilose flies, front quite brassy; third antennal segment orbicular, orange, black margined narrowly above; face bare, shining black (Idaho) . . . *julietta* Shannon
- Arista as long as, or longer than, width of front . . . . . 3
3. Abdominal pile bicolored . . . . . 10
- Abdominal pile unicolorous and pale . . . . . 4
4. Shining blue or purplish black flies, the legs almost wholly black and black pilose, the bases of the tibiae very dark brown (California, Oregon) . . . . . *chalybescens* Williston
- Not so colored upon abdomen and legs . . . . . 5
5. Face unusually deeply produced and paratuberculate, the golden pile with a reddish tinge; predominant pile of hind femora long, shaggy, and golden, with a long, golden tuft dorso-apically and with several extra long ventrolateral golden bristles; hind basitarsal pile mixed black and golden; ocular pile reddish brown; only two or three black hairs on thorax, above wing (Oregon, Washington) . . . . . *ferruginea* Lovett
- Not such flies . . . . . 6
6. Thorax and especially the abdomen greenish brassy; face deeply concave above the prominent tubercle; last section of first posterior cell relatively short; vertex or scutellar margin or both with some black pile (bristly upon scutellum); mesonotum rarely with occasional black hairs among the golden (Oregon, Washington) . . . . .
- . . . . . *hirsuta*, new species
- Face gently sloping away from, and shallowly concave above, the low tubercle . . . . . 7
7. Face pubescent; all the femora with black setae apicoventrally, their tibiae and basitarsi golden pilose; mesonotum bright brassy with almost a bronze or cupreous cast; last section of first posterior cell exceptionally short; wing veins and middle of wing strongly tinged with brown (Oregon, Washington) . . . . . *seripila*, new species
- Not such flies . . . . . 8
8. Small flies, shining greenish black; mesonotal pile with reddish tinge; hind femora extensively black pilose below; apical pile of fourth, or third and fourth segments appressed; apex of hind tibiae very narrowly brown, the tibiae chiefly black pilose except medially, their basitarsi black pilose; wings moderately but uniformly tinged with brown (Oregon, Utah) . . . *hermiona*, new species
- Larger species, the mesonotum with brassy black reflection . . . . . 9
9. All the femora, their tibiae and tarsi entirely golden pilose; facial tubercle somewhat more deeply concave (than in *seripila* or *robusta*) and the facial tubercle equally abrupt above and below (Utah, Colorado, Oregon, Washington, Alaska) . . . . .
- . . . . . *lasiophthalmus* Williston
- Facial tubercle low, wide, and gently sloping into the moderately deep concavity below the antennae; hind femora at least with some scattered black pile, the pile of abdomen a little longer (Alaska) . . . . .
- . . . . . *robusta* Hine
10. All the tibiae deep black to their apices, only the bases pale, their pile and that of the femora about equally black and golden; all the tarsi black and black pilose above; pile of mesonotum and eyes almost white (Colorado) . . . . . *hiantha*, new species
- Tibiae noticeably orange or reddish brown at apex . . . . . 11
11. Facial strips exceptionally wide and bulging; facial tubercle very low and truncate; face quite short; last section of first posterior cell exceptionally short; femora and their tibiae, except the medial surface, almost entirely black pilose (Colorado) . . . . .
- . . . . . *nigrobarba*, new species
- Face strips not unusually wide and bulging; tubercle larger, face longer, last section of first posterior cell longer; pile of hind tibia wholly golden . . . . . 12
12. Face thickly pubescent throughout (Idaho) . . . . .
- . . . . . *bicolorata* Shannon
- Face almost or wholly bare and polished black, with mere traces of fine pubescence beneath the antennae (British Columbia) . . . . .
- . . . . . *pluto*, new species
13. Front coxae bluntly to sharply angulated on outer anterior corner and often with a short and distinct but usually blunt spur . . . 14
- Fore coxae rounded, without blunt or sharp angle and without spur . . . . . 16
14. Front coxae with a sharp short spur; pile of thorax flat appressed or semi-appressed. 15
- Front coxae with an obtuse spur, or sometimes bluntly angulate; mesonotal pile erect.

- Hind tibiae extensively black pilose on outer surface (Alaska) . . . *bigelowi*, new species
15. <sup>r</sup>Legs entirely black or sometimes with narrow bands of dark brown at base of anterior tibiae or tarsi (Idaho) . . . *aldrichi* Hunter  
Legs in part yellowish or light brown (Colorado) . . . . . 40
16. Thorax bronze brown. Ocular and pleural pile silvery; frontal, mesonotal, and scutellar pile wholly silky yellow, rather deep except on the front, and erect. Abdominal pile thick, deep golden; on the whole of the abdomen except the sides of the second segment, flat appressed, third antennal segment clear orange (Mexico) . . . . .  
. . . . . *chrysochlamys* Williston  
Not such flies . . . . . 17
17. Deep blue black flies; at least the face greatly shining. Thorax and scutellum with at least some black pile or bristles, often wholly black . . . . . 18  
Not deep shining blue flies, rarely greenish black . . . . . 19
18. Coxal and pleural pile wholly black (Alaska) . . . . . *alaskensis* Hunter  
Coxal and pleural pile wholly pale or a few black hairs at top of pleura; facial profile with a conspicuous tubercle; thorax vittate viewed from behind; sometimes a few hairs on face . . . . . 39
19. Femora and hind tibiae at least, wholly black; fore tarsi sometimes partly pale; mesonotal and abdominal pile quite flat appressed, the former wholly black; wings strongly tinged with yellowish brown, more yellowish upon the basal half; eyes nearly or quite bare (Massachusetts) . . . . . *hiawatha* Shannon  
Legs usually if not always in part pale on tibiae and femora, or if very dark brown or black, not as described above; if the pile is flat appressed, that on mesonotum not wholly black; wings differently colored . . . . . 20
20. Hind metatarsus entirely pale setate . . . . . 21  
Hind metatarsus with considerable black setae on outer and dorsal margins . . . . . 24
21. Fourth abdominal segment widely flat, appressed pilose across the middle, the anterior corners with erect pile; pile either pale or black . . . . . 22  
Fourth segment with almost wholly erect pale pile, few semi-decumbent pale hairs on the posterior border; scutellum with a few long yellow bristles, mesonotal pile rather long, erect . . . . . 35
22. Mesonotum faintly coppery; abdominal segments with erect white pile in the anterior corners, followed by a diagonal band of flat appressed white pile, followed by extensive appressed black pile. Scutellum with eight or more black bristles (South Dakota, Minnesota) . . . . . *dakota*, new species  
Not such flies . . . . . 23
23. Pile of abdomen wholly pale, in part appressed; long hairs of scutellum pale (Ohio, Wisconsin) . . . . . *cineralis*, new species  
Pile of abdomen at least with some appressed black setaceous hair in the middle of the segments; scutellar rim with or without black bristles (Ontario, North Dakota, New England) . . . . . *orilliaensis* Curran
24. Mesopleura and usually the scutellar disc with some black pile among the golden; black pile sometimes abundant; front always black pilose . . . . . 43  
Not such flies . . . . . 25
25. Abdomen with alternating hair bands of white erect pile in the anterior corners, flat diagonal whitish pile and black appressed pile. Antennae brown or black, small, darkly infuscated above; scutellum often with black bristles . . . . . 31  
Abdomen without such alternating hair bands, the posterior margin of the segments sometimes with subappressed pile . . . . . 26
26. Pile of thorax and abdomen wholly pale, exceedingly and unusually short, flat, appressed; rather small, polished, greenish black flies, with pale orange antennae and very deeply concave face; scutellum without black bristles. Eyes almost bare (Manitoba, Alberta) . . . . . *hunteri* Curran  
Not such flies . . . . . 27
27. Pile of abdomen wholly pale, usually almost wholly appressed on the fourth segment; scutellum with eight or more black bristles, third antennal segment dark brown; size quite small, 5 to 6 mm. (Colorado, Alberta, Alaska) . . . . . *borealis* Coquillett  
Pile in part black, or, if wholly pale, the scutellum is either without black bristles, or the fourth segment pile erect; the size is much larger, etc. . . . . 28
28. Facial tubercle large, or the face strongly produced forward, the tubercle abrupt above; mesonotum with extra thick, nearly erect, golden pile in which there are no black hairs save perhaps a single one above the wing; pleural and scutellar pile wholly pale; antennae brown . . . . . 42  
Facial knob not so prominent; mesonotum not unusually pilose; moderate-sized species, or if the facial knob appears well developed, there is some black pile on front, mesonotum, and at least some scattered black pile on the scutellum . . . . . 29
29. Pile of abdomen almost wholly erect; scutel-



- lum usually with long, black, marginal bristles . . . . . 30
- Pile of abdomen with appressed whitish hair, in posterior corners of second and third segments; antennae dark brown; scutellar margin wholly pale yellow or golden pilose (Colorado, all Pacific states) . . . . .
- . . . . . *baroni* Williston
30. Antenna black; hind femur with considerable black pile on outside and ventral surface (Oregon) . . . . . *nigrescens*, new species
- Antennae reddish brown to light brownish orange; hind femoral pile wholly light yellow, no black pile . . . . . 34
31. Scutellum without black bristles; antennae dark brown to black; wings with little if any brown cloud . . . . . 32
- Scutellum with black bristles and otherwise not as above. Third antennal segment light brown or orange, in some species only on the base; wings with a strong brown cloud in middle . . . . . 33
32. Medium-sized species, 9 to 10 mm.; mesonotum and front with unusually thick, wholly pale, yellowish white silvery pile; all tibiae light orange at base and apex; third antennal segment dark brown (Colorado) . . . . .
- . . . . . *Chilomyia livida* Wehr variety
- Small species, 6 mm., not as above; antennae black; front with some black pile; tibial bases brown (Colorado) . . . . .
- . . . . . *nannomorpha*, new species
33. Scutellum with short black bristles; hind tibiae black pilose laterally and ventrally (New Hampshire) . . . . . *nokomis*, new species
- Scutellum with long black bristles; hind tibiae white pilose laterally and ventrally (Minnesota) . . . . . *angelica* Telford
34. Small species with frontal pile largely black and upper ocular pile black; mesonotum and scutellar disc with many black hairs (California) . . . . . *luna*, new species
- Large species, without these characteristics (Oregon) . . . . . *hirsuta*, new species
35. Last section of first posterior cell quite short . . . . . 38
- Distal portion of the first posterior cell long . . . . . 36
36. Third antennal segment pale orange (Idaho) . . . . . *florella* Shannon
- Third antennal segment dark brown, sometimes a little reddish basally . . . . . 37
37. Abdomen subcircular, the basal middles of second, third, and fourth segments with appressed pile directed towards the sides, tubercle of face small, face more shining; hind tibiae wholly pale orange excepting a tiny brown post-medial streak; no long pale hairs on margin of scutellum (California) . . . . . *scilla*, new species
- Abdomen elongate oval, the whole middles of the second, third, and apex of fourth segment with appressed pale pile that is diverted more or less diagonally and posteriorly; tubercle of face less prominent, face more thickly pubescent; hind tibiae blackish upon nearly the middle third; margin of scutellum with several pairs of much longer, pale, delicate hairs (Washington) . . . . . *margarita*, new species
38. Abdomen subcircular; black flies, rather sparsely short pilose; femora black; subapical cross vein nearly straight; face bare and polished black; last section of first posterior cell shorter; tubercle prominent, face deeply concave; first three segments of face and middle tarsi light orange (Michigan) . . . . . *tantalus*, new species
- Abdomen oval; black flies with pale brassy cast, long and thickly erect whitish pilose; subapical cross vein sigmoid; face thickly whitish pubescent, the ground color brownish or brassy black; tubercle less prominent, the face shallowly concave; first three segments of fore and mid tarsi brownish above (California) . . . . . *promethea*, new species
39. Pteropleural pile and almost all scutellar pile black; scutellum with many black marginal bristles; upper occipital pile black; mesonotal pile all or nearly all black . . . . . 41
- All pleural pile pale; mesonotal pile nearly all pale brassy; scutellar black bristles few; upper occipital pile pale; facial tubercle larger; abdominal pile almost or quite wholly pale; tibiae with much light orange brown; the anterior basitarsi light brown; no pile upon the face (Arizona) . . . . .
- . . . . . *catalina* Shannon
40. Mesonotal and abdominal pile shorter and more flat-appressed; bases and apices of tibiae paler and more reddish orange; vertex usually with some black hairs; facial concavity not so deep (Utah, Colorado) . . . . .
- . . . . . *pikiei* Shannon
- Mesonotal and abdominal pile longer and not so appressed, especially upon mesonotum; bases and apices of tibiae darker; vertex and front white pilose; facial concavity quite deep (British Columbia) . . . . .
- . . . . . *columbiae* Curran
41. Tubercle of face tiny, the concavity shallow; tibiae very dark brown to black at the base; scutellar discal pile long; front narrow, not protuberant above in profile; face with a few scattered black hairs (Washington, Idaho) . . . . . *Chilomyia burkei* Shannon

- Tubercle larger, the concavity deeper; the tibiae a lighter brown at the base of all pairs; scutellar discal pile quite short; front much wider and noticeably protuberant above in profile; no pile on the face (British Columbia). . . . . *subchalybea* Curran
42. Ocular pile silvery; facial tubercle prominent but the face not greatly produced; general color shining greenish black. Antennae dark reddish brown (Wyoming). . . . .  
 . . . . . *meganosa*, new species  
 Ocular pile yellowish brown to golden; face greatly produced forward with the tubercle abrupt above; general color strongly brassy; antenna orange brown (Oregon). . . . .  
 . . . . . *cratorhina*, new species
43. Third antennal segment larger, thickly punctate, silvery pubescent; facial concavity short and very deep; mesonotum and scutellum with many black hairs mixed with the golden, sometimes almost wholly golden; pile of abdomen largely black, at least through the middle of the second and third segments (Washington). *obesa*, new species  
 Third antennal segment smaller, with few punctures; facial concavity longer and much more shallow; scutellum and mesonotum with some black hair intermixed; pile of abdomen wholly pale golden brassy, suberect in the middle of the third segment (Oregon). . . . . *porcina*, new species

#### ***Cheilosia alaskensis* Hunter**

*Chilosia alaskensis* HUNTER, 1897, Canadian Ent., vol. 29, p. 124.

A dark, shining, blue black species. The face is highly polished, blue black, and the pile is everywhere virtually all black. The front is inflated as in some species of *Chrysogaster*, its medial depression very little marked; in the male the front is highly polished, the medial sulcus shallow and apparent only on the upper half. The antennae are quite small on the male with the third segment yellowish orange and slightly darkened above. The mesonotum is partly opaque and its pile virtually all black. Pile of legs nearly all black. The abdomen is very largely polished and shining. On the wings the costa is pulled down at the apex, and the distal angle of the first posterior cell is long and acute. Length 9 mm.

Apparently unrelated to other North American *Cheilosia*. The wing type, however, is duplicated in *Cartosyrphus*, in some species,

and again in *Hiatomyia townsendi* Hunter and *Hiatomyia cyanescens* Loew.

#### **DISTRIBUTION**

Type, Alaska, Cook's Inlet, one female (location of type uncertain or type lost).

MATERIAL REVIEWED: Oregon, Corvallis, May 14, 1928, one male.

RECORDS BY OTHERS: British Columbia, Port Renfrew, Glacier, Vancouver, Osburn.

#### ***Cheilosia alaskensis flavipennis*, new subspecies**

Figures 36, 56, 87

The individual from Oregon noted above has such a strong, uniformly yellow tint on the whole wing that it is regarded as a distinct variety.

#### ***Cheilosia dakota*, new species**

A flat-faced species heavily covered with white pollen, pile bicolored, black and white. The scutellum with bristle-like hairs on the rim, which are quite strong on the female. Closely related to *orilliaensis*. Length 7 to 10 mm., the average about 9 mm.

#### **MALE**

HEAD: Black, the face with a broad but rather low tubercle, the oral margin receding; entire face rather heavily coated with white pollen which is extended as a very narrow strip next to the eyes on the front. Facial strips and cheeks white pubescent and white pilose. Front shining black with a small amount of white pubescence in the sculcus, especially towards the antennae; pile all dark brown to black. Ocellar triangle dull black with yellowish brown pile and a few black hairs near the anterior ocellus. Cilia mostly black, the pile on the occiput predominantly white with a few darker hairs above. Antennae mostly brownish to orange, more reddish below, somewhat rectangular in shape, the apex oblique with the upper corner rounded; arista black, finely white pubescent. Eyes entirely whitish to yellow pilose.

THORAX: Mesonotum dark with very faint indications of three coppery vittae, the pile yellowish brown, becoming broadly black along the sides, especially on the notopleura and postallar calli. Scutellum with a pre-apical depression, the pile predominantly yel-

low on the disc with longer, bristle-like hair on the rim, the fringe rather heavy and silvery white. Pleural pile virtually all black or brown with a few lighter-colored hairs on the sternum. There is quite a prominent patch of white pubescence just above the front coxae.

**LEGS:** Dark reddish brown, with the apex of the femora, all the tibiae except a broad median ring, and the basal three segments of the tarsi yellowish to reddish. At the bases of the front femora there is a prominent patch of yellowish to golden setose hairs; smaller patches appear at the bases of the middle femora. Pile of the legs mixed, mostly white on the femora, many black hairs on the apex and anterior sides of the femora and tibiae.

**WINGS:** Hyaline, the stigma pale yellow. Squamae light brownish in color, the plumule white, halteres yellowish with a darkened knob.

**ABDOMEN:** Opaque black, shining along the sides and entirely shining on the fourth segment; the pile mostly black but pale along the sides, especially on the anterior corners of the segments. Venter heavily pollinose, the pile white, becoming black on the third segment and all black on the fourth segment.

#### FEMALE

Paler throughout, especially the legs; the pile all whitish except near the ocelli above the wing base and on the disc of the second, third, and fourth abdominal segments. These black hairs on the abdomen are short and appressed, the white hairs along the sides fine and erect except on the posterior corners of the terminal segments. On the posterior apical edge of the hind femora there are a dozen short black bristles, and the pile of the hind tibiae is mostly black. Bristles of the rim of the scutellum eight in number and rather strong. The antennae are slightly darker than on the male.

#### TYPES

Holotype, male; allotype, female; 16 male and one female paratypes, South Dakota, Custer, July 16, 1924; one male paratype, Minnesota, Itaska Park, July 25, 1937 (holotype and allotype, A.M.N.H.; paratypes, Hull coll. and A.M.N.H.).

#### *Cheilosia cineralis*, new species

A black fly, moderately shining, with perhaps a faint bluish green coat; pile distinctive and white; hind basitarsal pile golden in both sexes. Related to *dakota*, but facial tubercle narrow and pinched, instead of broad and flat, and there are no black bristles on the scutellum. Length 9 mm.

#### MALE

**HEAD:** Eyes sparse, whitish pilose, the face shining black with a slight bluish cast, broadly pubescent, the pubescence pale brownish yellow. The facial strips are broad, dark mahogany brown, thickly pubescent and white pilose. The front is shining black, whitish pubescent, the long pile entirely white; vertex white pilose. The antennae are brown, the third segment is somewhat reddish on the base, especially above and below. The arista is dark brown with microscopic pubescence. There are no pits upon the third segment.

**THORAX:** Shining black with a faint, bluish impression with quite vague traces of a pair or more of coppery vittae. The pleural, mesonotal, and the long, thick scutellar pile is wholly pale with the exception of three black hairs above the root of the wing.

**LEGS:** Femora shining, brownish black, the tibiae light brown, the middle third of the outer surface of the anterior pair and of the middle pair and a small brown spot on their medial surface blackish. The entire middle third of the hind tibiae brownish black. The tarsi are dark brown, the metatarsi entirely light golden pilose above. All of the tibiae and all of the femora are light yellowish pilose, the latter rather thickly pale pubescent.

**WINGS:** Pale brown, somewhat darker on the anterior half behind the stigmal cell. The third vein is unusually straight, the subapical cross vein sigmoid, without spur, the stigma deep yellow.

**ABDOMEN:** Elongate oval, shining black with a slight bluish luster, but the middles of second and third segment are more dull and subopaque. The abdominal pile is of moderate length, almost wholly pale whitish and erect. There are a few semi-appressed hairs in the middle posterior portion of the second and middle of third segment, but they appear to be also pale in color.

## FEMALE

Similar to the male. The face is even more extensively pubescent, the facial strips are lighter red, the front with minute rugulose grooves and pits, and the lateral margins narrowly, to just beyond the ocelli, light red. The thorax and abdomen have the same slightly bluish black appearance.

## TYPES

Holotype, male, and allotype, female, Ohio, Columbus, May 2-4 (Hull coll.); two male paratypes, Wisconsin, Madison (A.M.N.H.); one male, one female paratype, Illinois, Carlinville (U. I.).

*Cheilosia nokomis*, new species

## Figure 32

This species is related to *dakota*. The appressed black pile of the fourth abdominal segment is more sparse; the whole pile is more yellowish where it is white in *dakota*. The tibiae are all extensively black in the middle, their bases and apices, of at least the last four, dark brown; upper occipital pile extensively black. Length 8 mm.

## FEMALE

HEAD: Eyes rather thickly shining white pilose, face and front shining black with a faint brassy cast; face with some pubescence, especially upon the sides; the facial strips densely pubescent and white pilose; the tubercle small. The face is moderately excavated above; the frontal pile wholly yellowish white, that of vertex chiefly fine and black with some pale hairs intermixed. Front microrugose, pitted along the sides with a tiny puncture before the antennae, and the white pubescence narrowly marginating the front for a short distance above the antennae. First two antennal segments dark brown, third segment light reddish brown, blackish along the dorsal and apical margin. The arista black, micropubescent.

THORAX: Mesonotum shining black, faintly brassy along the sides, slightly coppery over the middle, the pile short, thick, erect, together with that of pleura and scutellum wholly pale yellow except that there are five or six black hairs immediately above the wing base and two pairs of very slender black hairs on the scutellar margin, none on the noto-

pleura and one on the post calli of one side. The scutellar margin has numerous other yellow hairs but little longer than those of the disc. Scutellum shining black.

LEGS: Shining black, the basal two-fifths and apical fifth of front, middle, and hind tibiae brown; the anterior pair rather light, the others progressively darker. Hind tarsi black above; the anterior four tarsi dark brown except on the apical two joints. The hind metatarsi are black pilose along a narrow dorsal line. The anterior metatarsi are chiefly golden, in which there seem to be four or five black hairs. The pile of the hind tarsi is largely black on the outer lateral surface; the hind femora are black pilose ventrally only on the outer two-fifths, and there are also a few subapical, lateral black hairs.

WINGS: Pale brown, distinctly tinged with darker brown over the middle; the stigma yellow, the third vein quite straight.

ABDOMEN: Shining black, oval, with pale yellowish white pile that is erect over large triangles in the basal corners but is suberect in the posterior corners and is broadly flat appressed over the posterior middle of the second and third and to a less extent on the fourth segments. In the middles of these segments the pile is black.

## TYPE

Holotype, female, New Hampshire, Base Station, Mt. Washington, July 13, J. Bequaert (Hull coll.).

*Cheilosia margarita*, new species

## Figure 33

A small, shining species with slight brassy cast, and faint brown tinge on the wings. Related to *cineralis* but distinguished in the male by the black pile on the front, the longer and more yellowish pile in general, the presence of black hairs on scutellar rim, and in the female by the black pilose hind basitarsi and different facial tubercle. Distinguished from *florella* by wide and V-shaped tubercle in the male. Length 9 mm.

## MALE

HEAD: Eyes thickly short white pilose in front and above. Front moderately inflated with a moderately deep, medial sulcus. The



face and front are shining black, the latter sparsely whitish pubescent, the former with pale brown but inconspicuous pubescence which does not obscure the shining ground color. The tubercle is quite low but broad, and the face above it is barely excavated. The facial strips are broad, heavily pubescent and white pilose. The pile of the front and anterior part of the ocellar triangle is black, behind which are some yellowish hairs. There are a few whitish hairs along the narrow silver line margining the front. The antennae are brown, quite dark on the first two segments; the basal-ventral corner of the third segment is reddish, the arista black, microscopically pubescent.

**THORAX:** Mesonotum shining black, with rather long, erect, yellowish brown pile with one or two black hairs on the notopleura and four above the wing base. The pleural pile is wholly brownish yellow, its pubescence white. The scutellar pile similar to that of mesonotum, with three long, very delicate, black, marginal hairs which could scarcely be called bristles on the margin, two on one side, one on the other. The marginal pale pile is somewhat longer than that elsewhere on the disc. Halteres dark brown, squamae pale yellow.

**LEGS:** Femora black, dully shining, the hind tibiae almost wholly black, the ventral surface of the apex narrowly dark brown, front and middle tibiae with the basal two-fifths and narrow apex brown. The tarsi are black; the metatarsal pile is black above, the tibial pile extensively black along the lateral, dorsal, and at least part of the ventral surface. The hind femora are short, golden brown pilose ventrally, on a little more than the basal half, blackish ventrally beyond; the lateral, basal pile is longer, is yellow except that the outer lateral pile on the apical two-fifths is black and among it there are two or three longer yellow hairs. The dorsal apical pile, however, is quite long and golden in contrast to more usual conditions.

**WINGS:** Pale brown, slightly darker behind the marginal cell. Stigma clear yellow.

**ABDOMEN:** Oval, shining black with a faint brassy cast, somewhat more dull broadly over the middle of the second and third segments. The pile is rather long, wholly erect, or barely suberect in the middles of

the second and third segments; nowhere flat. The pile is light yellowish brown in color, slightly appressed on the discs of the segments.

#### FEMALE

Similar to the male.

**HEAD:** The facial strips dark reddish brown; the pubescence of the face is appressed and obscures the ground color somewhat more. The front is broad, with, on either side of the eye margin located well above the antennae, a distinctive and conspicuous patch of white pubescence narrowly disconnected from that below. The upper side margins of the front are differentiated and punctate. The pile of the front and vertex is wholly pale yellowish white with the exception of two black hairs on either side of the ocelli and a few subvertical, occipital, black hairs.

**THORAX:** The thorax and scutellum are similar, the latter having slender, yellow instead of black bristles; they can scarcely, if at all, be differentiated from the hair.

**LEGS:** The tibiae, including the hind pair, are almost wholly pale yellow pilose; even the middles of the hind tibiae are yellow pilose over the dark-colored area.

**ABDOMEN:** The pile of the abdomen is quite flat-appressed and blackish rather narrowly in the middle of the second segment and a little more extensively in the posterior middle of the third segment. The pile of the fifth segment is wholly pale except that it is suberect post-marginally along the fourth segment.

#### TYPES

Holotype, male; allotype, female; and two paratypes, Washington, Mt. Rainier, July 7 (holotype and allotype, Hull coll.; paratypes, A.M.N.H.).

#### *Cheilisia tantalus*, new species

Figures 50, 86, 111

A bare, sparse, short, pale pilose species. Shining black in color, with subcircular, convex abdomen and the wings rather strongly tinged with yellowish brown in the middle and the base. First three segments of fore and middle tarsi yellow. Related to *promethea*. Length 7 mm.

## FEMALE

HEAD: Vertex and front shining black with slight brassy cast. The latter has a very faint medial, impressed line and a narrow, shallow, transverse excavation. The pile is very sparse, erect and yellowish white, deeper upon the occiput. Antennae reddish brown, the third segment slightly longer than wide, more orange below, more smoky apically; the short arista is basally thickened, light brown, darker apically. The face is considerably produced forward and very little downward. It is shining greenish black with almost no pubescence and no pile. The facial strips are bare but quite pilose. The facial tubercle is small, abrupt below, and sloping rapidly down to the deepest portion of the face vertically below the antennae. Viewed frontally the tubercle is quite narrow, the ocular pile sparse and white.

THORAX: Shining black, sparsely reddish golden pilose, including the scutellum. There are no black hairs except three upon the notopleura and one above the wing. The scutellum is partly denuded but appears to have had one or two pairs of stronger, bristle-like hairs.

LEGS: Femora shining black, the apices of the femora and the apical third of all of the tibiae obliquely light yellowish brown; the bases of these tibiae are similarly colored for about a third of their length and on the basal half of the middle tibiae. The first three segments of the fore and middle tarsi are light yellowish, the remaining segments and the hind basitarsi and their last two segments dark brown. The second and third segments of the hind tarsi are brown. All the tarsi are golden pilose above. Pile of femora golden laterally and ventrally and with only three or four slender, short, black, ventro-apical hairs; all the tibiae are golden pilose.

WINGS: Tinged with yellowish brown, particularly just past the middle; they are a little more brownish basally. The subapical cross vein is virtually straight and joins the last section of the third vein at a little more than a right angle; the distal section of the first posterior cell is quite short; its cross vein has a strong spur.

ABDOMEN: Nearly circular, shining black,

with entirely erect, yellowish white pile of moderate length. There is no depressed pile even in the middles of the segments where it is somewhat shorter.

## TYPE

Holotype, female, Michigan, Eaton County, May 30, 1942, R. Dreisbach (A.M.N.H.).

A patch of minute tubercles lies on each side of the face, but no hairs or evidence of denudation is present; yet it is possible it may be a *Chilomyia*.

*Cheilosia scilla*, new species

Figures 19, 61, 99

A brassy black species, entirely erect, pale pilose; the antennae are dark; the hind tibiae are almost wholly light orange. Related to *margarita*. Length 6.5 mm.

## FEMALE

HEAD: Occiput somewhat more tumid than usual; the front is shining brassy with prominent granulations; the ocular lunate areas are thickly punctate. Down the middle of the front is a slender, linear groove, and the transverse excavation is almost wanting. The pile of front and vertex and occiput is entirely shining whitish with a slight yellow tinge. It is erect in the middle of the front but thicker and appressed along the ocular margins. The antennae are wholly dark sepia brown; the third segment is slightly reddish basally, orbicular, and yellowish white pubescent; the arista is very dark brown, nearly bare. The face is greenish black, bare upon the tubercle and above the tubercle except just below the antennae. There is thick, pale yellow pubescence laterally and obliquely upon the lower part of the face, but no pile. The face is diagonally produced for a very short distance. The tubercle is conspicuous, equally abrupt above and below, the concavity deep. The facial strips have yellowish pile, without pubescence. The ocular pile is moderately thick and pale yellow.

THORAX: Brassy black on mesonotum and scutellum, the pile quite thick, not quite erect, and pale yellow, including that upon pleura. There are two or three black hairs above the wing, none on notopleura or scu-

tellum and no differentiated bristles; the scutellar pile is erect.

**LEGS:** Femora dark brownish black, the apices of all the femora obliquely yellowish. The basal two-fifths of the middle tibiae and anterior tibiae and the apical fifth of each tibia and the whole of hind tibiae, except a tiny postmedian streak, light orange; the remainder is dark brown. The first two segments of the middle tarsi are orange, the remaining segments and all of front tarsi and all of hind tarsi, except the apices of the first three segments, dark sepia brown. All of the tarsal pile is golden. The hind femur is entirely golden pilose, except for two or three short, delicate, black hairs ventro-apically, scarcely noticeable. All the tibiae are golden pilose.

**WINGS:** Pale brown, particularly near the middle, the stigmal cell is yellow, the first posterior cell has the distal section moderately long, its cross vein has a strong basal spur and makes a right angle with the third vein.

**ABDOMEN:** Nearly circular, strongly shining greenish brassy, and convex. The pile is wholly erect except in the middle of the second and third segments where it is directed diagonally outward and in the midline directed posteriorly. All the abdominal pile is pale yellow.

#### TYPE

Holotype, female, California, Inyo County, Lone Pine, June 10, 1937 (A.M.N.H.).

#### *Cheilosia promethea*, new species

Figures 14, 88

A brassy black fly, quite long and densely pilose, with low tubercle with shallow concavity; the face is thickly and wholly pubescent, and the wings are strongly tinged with yellow, especially at the base. Related to *tan-talus*. Length 8 mm.

#### FEMALE

**HEAD:** Occiput rather thick but not immediately thickened behind the eye margin; the pile of the occiput, vertex, front, eyes, and facial strips entirely pale yellowish white and everywhere erect, quite long, and thick. The ground color of the front is brassy black, granulate; the lunate areas are elongate, deep red laterally, and punctate. Down the middle of the front is a conspicuous but narrow

groove, on either side of which the front is striate. The transverse excavation is wanting. The antennae are medium brown; the third segment is subquadrate on the dorso-apical portion and slightly blackish along this margin; the pubescence is yellowish. The arista is dark brown, nearly or quite bare. The face is black with a slight brownish or brassy cast; pubescence thick, short, and yellowish white. The tubercle is low, gently sloping above and below; the facial concavity is quite shallow, the face moderately produced diagonally and to a considerable extent downward. The facial strips are wide, mahogany red below, medially incised near the middle, and bare of pubescence.

**THORAX:** Mesonotum and scutellum brassy black with very thick, erect, pale yellow pile without any black bristles. The humeri are entirely pale yellow pilose. The scutellum has a rather deep, polished, bare, medial, apical notch, the sides rounded on either side. Down the middle, confluent with the notch, is a narrow, polished bare area.

**LEGS:** The femora are medium brown, the apices obliquely yellowish; the basal two-fifths of the hind tibiae and anterior tibiae and half of middle tibiae light yellow. The apices of all the tibiae are orange narrowly. All the tarsi are brown, the apices of the first two segments somewhat reddish brown. All the basitarsi have about half-and-half mixed golden and blackish pile. Pile of hind femora entirely light yellow except for two slender apical blackish hairs ventrally. All the tibial pile is light yellow to golden.

**WINGS:** Short, strongly tinged with yellowish brown basally, the remainder of the wing pale brown. The stigmal cell is yellow; the subcostal vein and veins of the basal cells are yellowish, the remaining veins light brown. The subapical cross vein is slightly sigmoid, with a basal spur, the last section of the fourth vein long, the distal section of first posterior cell quite short.

**ABDOMEN:** Oval, but little convex except along the sides; shining black with brassy luster laterally; the pile is entirely pale and erect, longer on the sides, short in the middle of the second and third segments, but of nearly equal length through the fourth segment.

## TYPE

Holotype, female, California, Mt. Tallac, Tahoe, July 15 (A.M.N.H.).

This is the only species known to the authors in which there are no radial sector bristles; there is, however, thick pubescence.

**Cheilosia consentiens** Curran

*Chilosia consentiens* CURRAN, 1926, Canadian Ent., vol. 58, p. 211.

We have not seen this species. Curran considered it related to *orilliaensis*. Known only from the female type. The description is as follows:

"Related to *C. orilliaensis* Curran, from which it is at once distinguished by the presence of a patch of black pile above each antenna, of numerous short black hairs on the thorax among the longer pale pile and longer abdominal pile. Length 10 mm.

"Female. Black. Face deeply concave between antennae and tubercle, the oral margin as prominent as antennal base, shortly concave beneath tubercle which is large, rounded and very prominent; face not produced downwards; moderately covered with greyish pubescence except the tubercle, thickly pollinose above and on the side margins. Front gently widened anteriorly, the lateral depressions fairly wide, median sulca not deep; depression across lower fourth conspicuous; pile black on upper third and above each antenna, elsewhere pale, fairly long; occiput densely greyish pollinose, the pile pale cinereous. First antennal segment black; second brownish red, third narrowly brownish above and apically, elsewhere reddish; rectangular with rounded corners, one and one quarter as long as wide; arista slender, scarcely as long as width of front.

"Thorax with indications of aeneous, the pile erect, fairly long for female with black hairs intermixed (these longer behind), with the pile yellow. Scutellum with marginal bristles.

"Legs black; apices of femora, anterior four tibiae on basal third and apical fourth, and the posterior tibiae on basal fourth and apical fifth, reddish; first segment of anterior four tarsi ferruginous reddish. Pile pale, the tibiae and tarsi with black hairs above.

"Wings pale luteous on basal half, lightly

infuscated beyond the middle but becoming greyish apically and posteriorly; apical cross-vein strongly oblique except on base and apex. Squamae white; halteres yellow.

"Abdomen shining black, the second and third segments subopaque, except that the sides and large anterior triangles are shining; pile fairly long, whitish or pallidly yellowish; each segment with a large apical triangle of appressed black pile reaching well across the segment but not extending to the base."

## DISTRIBUTION

Ontario, Low Bush, Lake Abitibi, June 16, 1925, one female, N. K. Bigelow coll. (C.N.C.).

RECORDS BY OTHERS: None.

**Cheilosia orilliaensis** Curran

## Figure 27

*Chilosia orilliaensis* CURRAN, 1922, Canadian Ent., vol. 54, p. 67.

A shining black species with rather abundant yellow and black pile; on the male the pile is black on the front, along the sides of the mesonotum, on the scutellum, and on the discs of the segments of the abdomen; on the female, the pile is mostly whitish, a few black hairs near the ocelli and down the middle of the abdominal segments where it is short and closely appressed. The antennae are elongate oval, rather dark reddish on the male, more yellowish on the female. There are long black bristles on the rim of the scutellum which are stronger on the female. The face is rather definitely whitish pubescent, but the tubercle is quite low although more prominent on the female. The abdomen is of the short type, rather convex.

Closely related to *dakota*. In the male of *dakota* there is a constant coppery reflection upon the mesonotum, and the central pile of the mesonotum is more largely clear, pale yellow; in both species the lateral mesonotal pile is largely black; the face of *dakota* is thickly, uniformly pubescent in both sexes, in the male *orilliaensis* chiefly bare. Of the females *orilliaensis* is the more robust, the abdomen a little wider, the third antennal segment almost wholly clear light orange; the appressed central pile of the fourth segment is wholly whitish. In *dakota* the apical half of the third antennal segment is smoky black,



the central pile of the fourth abdominal segment extensively black. Length 9 to 10 mm.

#### DISTRIBUTION

Type, Ontario, Orillia, and New Brunswick, 57 males and 81 females (C.N.C.).

MATERIAL REVIEWED: Paratypes (Hull coll.).

RECORDS BY OTHERS: Maine, Mt. Desert, Johnson; New Hampshire, Halfway House, White Mountains, Jaffrey, Johnson; New York, Ithaca, Labrador Lake, Shannon; North Dakota, Turtle Mountains, Shannon.

#### *Cheiliosia minnesotensis* Telford

Figures 6, 49, 79, 81, 106

*Cheiliosia minnesotensis* TELFORD, 1939, Minnesota Tech. Bull., no. 140, p. 36.

A rather large, elongate black species, with black frontal pile and mixed black and yellowish pile upon the mesonotum. Abdominal pile erect, pale brown except upon the last half of the fourth segment. Related to *orilliaensis*. Length 10.5 mm.

#### MALE

HEAD: Eyes rather thickly pale brown pilose, the pile of moderate length, front somewhat rounded, roughened; the abundant, rather long pile black, fine, and delicate, leaving only a quite small area in the middle bare. Pile of vertex yellowish, two or three black hairs in the front between the ocelli, the remainder of the ocellar and postocellar pile pale yellow. On either side of the postocellar region there is a row of long black hairs and shorter pale yellow ones behind, remainder of occipital pile pale, impression of front well developed, not reaching eye junction, giving way to a flared-out place anteriorly just before the antennal lunule. Face black, moderately shining, not much produced; the tubercle unusually large, rounded, not very prominent. Face broadly and heavily pubescent including tubercle and epistoma, except for a narrow posterior margin, and all of checks except on a narrow horizontal bare line about the middle. Facial stripe moderately broad, heavily pubescent, and extensively white pilose. Antennae small to moderate sized, first two segments brown, second a little shining, third longer than wide, brown on the outer diagonal half, orange basoven-

trally; pile of arista dark brown, thickened on the basal third, one basal joint visible; first segment pale, second segment black.

THORAX: Mesonotum shining black with faint coppery reflections, more pronounced in the middle, its pile all erect, quite fine, of moderate length or better, chiefly pale yellowish but with considerable fine black pile mixed across the anterior third; wholly black on the notopleural triangles, almost wholly on the humeri, a few black hairs above wing marginally; postalae wholly black pilose with three black bristles and about four or five black bristles above the root of wing. One on notopleura. Pleura is silvery pilose; a tuft of fine black hairs on upper part of pteropleura, a larger one on upper mesopleura together with two long black bristles. Scutellum shining black with fine, long, erect, black pile slightly sparse on disc; there is some slightly shorter fine whitish pile on disc and on margin; there are 12 to 15 pairs of rather long, fine, tuberculate, bristly hairs from apex to base and a few shorter pale hairs; ventral fringe quite long, abundant, wholly silvery.

LEGS: Femora black, moderately shining, not especially thick, apices of all femora narrowly light brown, pile of hind femora pale whitish along the sides of the basal two-thirds and wholly along the dorsal margin to apex. Most of the lateral apical pile, virtually all on apical third, is black. Upper guard row at least as long as femur is wide, ventral row not quite so high as femora; black pile limited to the middle and apical regions ventrally. Tibiae with basal third of hind, nearly basal half of middle, more than the basal third of anterior, light brown, almost yellow on anterior pair; apices of the tibiae narrowly brown posteriorly and on the front four tibiae yellow on at least one-sixth. Posterior tarsi black; anterior tarsi dark brown above, yellow laterally, middle basitarsi yellowish on basal half or more. Pile of tarsi black above, on all pairs except for two or three scattered golden hairs above on anterior basitarsi. Hind tibiae extensively black pilose on outer surface, golden pilose on inner margin, chiefly black above and below.

WINGS: Uniformly pale brown, the stigma deep yellow, costal cell and base of marginal cell paler; the postical cross vein straight, the subapical almost straight, rectangular to cur-

vature of third vein just before its end; sub-apical spur virtually absent.

**ABDOMEN:** Not so wide as thorax; the pile erect, pale brown on second, third, and basal half of fourth segments, rather long except in the middle; pile of posterior half of fourth segment long, fine, black, including the lateral margins. Pile of right half of hypopygium pale, of left half black, of first segment silvery.

#### DISTRIBUTION

Type, Minnesota, Two Harbors, Hennepin County, two males (U. M.).

**MATERIAL REVIEWED:** The type.

**RECORDS BY OTHERS:** None.

#### *Cheilosia nigrofasciata* Curran

Figures 31, 75, 80, 93

*Chilosia nigrofasciata* CURRAN, 1926, Canadian Ent., vol. 58, p. 174.

Related to *florella*, but characterized by protuding face and pale orange third antennal segment. The mesonotal pile is golden, with some black hair intermixed; there is short, brown to black, distally sparse, suberect pile on the abdomen. Length 8 mm.

#### MALE

**HEAD:** Eyes moderately, densely, brown pilose; front and vertex black pilose; the former rather long, not very thick, broadly bare in the middle with a well-formed but not deep medial impression running to the eye margin. A few pale hairs behind the black ones on the upper part of the occiput. Face shining black, with very pale brassy reflections; sparsely pubescent over most of the face, stopping at the cheeks, more or less absent on the tubercle. First antennal segment dark brown, other two uniformly light brown; the second shining, the third evenly rounded. The arista dark brown, a little thickened basally.

**THORAX:** Brassy black, moderately shining; the pile is of moderate length, tending to be bristly but delicate, almost erect, wholly erect posteriorly and light yellow, except that it is extensively mixed with black; it is wholly black on the notopleura, widely black above the wing and on the postalar calli. There are no true bristles, but the supra-

alar marginal hairs are somewhat stiffer. Scutellum shining black, with both black and pale pile which is not extremely abundant. The margin has about six pairs of quite long, extremely fine, bristly hairs; the dorsal pile more or less erect. There is some pale marginal pile. Pleural pile pale yellowish with a black tuft above on mesopleura. One or two black hairs on pteropleura.

**LEGS:** Shining black, the apices of the femora dark brown, the basal third of fore and hind tibiae and basal half of mid tibia brown. The apical fifth of all of the tibiae and the anterior and middle basitarsi brown. Posterior basitarsi blackish, becoming light brown ventrally, without lateral bristles but with one or two apical bristles. Pile of tarsi black.

**WINGS:** Uniformly light brown, barely darker near the base before the middle cross vein. Stigma yellowish brown. Subapical cross vein rectangular to the curvature of the third longitudinal vein.

**ABDOMEN:** Light brownish pilose on first, second, third, and fourth segments. Suberect in the middle of third and fourth segments, and quite erect on the sides. Venter with erect pile on the second segment, the third and fourth with definitely quite flat, appressed, reddish brown bristly pile which is short; their post-margins have longer pile.

#### DISTRIBUTION

Type, Ontario, Lake Abitibi, 60 males (holotype) and 199 females (allotype) (C.N.C.).

**MATERIAL REVIEWED:** Paratype, and one (May) from Alberta, Banff, compared with type.

**RECORDS BY OTHERS:** None.

#### *Cheilosia obesa*, new species

Entirely black, with faint greenish tinge and with mostly black pile, which is rather short but erect on the mesonotum; antennae dark brown. Stout, robust flies. Related, though not closely, to *meganosa*. Length 9 mm.

#### MALE

**HEAD:** Eyes with sparse, pale pile; the face and front shining black, the former virtually without pubescence. The tubercle is large,

prominent, deeply excavated above; the strips are broad, non-pubescent, and broadly, pale yellow pilose. The pile of the front is black, of the vertex both yellow and black. Antennae very dark brown, almost black, the third segment orbicular, grayish white pubescent with numerous minute punctures. Arista dark brown, bare and shining.

**THORAX:** Mesonotum shining black, with a faint greenish tinge, the pile moderately long and thick and almost wholly pale yellow. There is, however, considerable black pile narrowly above the base of the wing and on the notopleura, and on the entire mesopleura the pile is black. The pile on the pteropleura, with the exception of one or two hairs, is pale. The scutellar pile is wholly pale; that upon the margin and just before the margin is considerably longer than that upon the mesonotum; there are no bristles.

**LEGS:** Black, dully shining; the narrow apex of the femora, the basal third of all of the tibiae, the narrow apex of front and middle tibiae dark brown. The hind tibiae are black to the apex, though they become somewhat brownish ventrally. The tibial and femoral pile is almost wholly black, the medial pile of the anterior and posterior tibiae pale golden. The tarsi are black and black pilose above, including the metatarsi.

**WINGS:** Pale brown, slightly darkened in the middle, the stigmal cell deep brownish yellow, the veins brown; the subapical cross vein relatively short, joining the last section of the third vein at right angles.

**ABDOMEN:** Oval but quite broad; shining black, with a faint greenish tinge, the middles of the second and third segment largely opaque. The pile is rather long and thick, wholly erect, light brownish yellow, except for some short, nearly erect pile in the opaque portions of second, third, and extreme middle base of fourth segment which is black. The marginal pile and all of the posterior pile of the fourth segment are wholly pale. Halteres dark brown. Squamae whitish with yellow fringe.

#### FEMALE

**HEAD:** Black, the face with a very rounded, prominent tubercle and with the slopes very lightly whitish pubescent; a patch of white pubescence in the corners below the vittae,

the pile virtually all black including the cilia on the upper occiput; lower occiput whitish pubescent along the eye borders, the pile virtually all black. Antennae slightly larger than in males, brown and a little reddish below; almost circular in outline; first two segments polished and brownish black; the arista brownish and slightly reddish towards the base. Eyes with long, whitish pile.

**THORAX:** Semi-shining greenish black on the sides; more brassy in the middle; the mesonotum with erect black pile with a patch of yellowish pile on the posterior corners of the mesonotum, a few yellowish hairs intermixed on the disc of the mesonotum. There is considerable pale pile on the mesopleura. There are one or two long black hairs on either side of the scutellum mixed in with the long yellow ones; or the pile may be almost wholly black; the fringe yellow.

**LEGS:** Black, reddish on the very narrow apex of the femora, basal third and narrow apex of the tibiae. The pile virtually all black, and a few pale short hairs on the outer edges of the front tibiae and the metatarsi.

**WINGS:** Hyaline, stigma yellowish. Squamae white, the fringe slightly brownish near the scutellum; plumule and halteres reddish to yellowish.

**ABDOMEN:** Semi-shining greenish black, somewhat dulled on the disc; the pile on the discs of the segments black and appressed, yellowish and erect along the sides, although there are more black hairs beyond the second segment.

#### TYPES

Holotype, male; allotype, female; and eight female paratypes, Washington, Pullman, May, 1926, F. M. Hull (holotype and allotype, Hull coll.; paratype, A.M.N.H.).

#### *Cheilosia meganosa*, new species

Figures 15, 58, 78, 95

A greenish black fly with deep facial concavity. Related to *obesa* Hull. Length 8.5 mm.

#### FEMALE

**HEAD:** Eyes sparsely covered with pale yellowish white pile. The front is quite broad, flattened, a little more narrow on the upper third and somewhat roughened; the pile is

almost wholly yellowish white, erect or nearly so, with a few black hairs just before the antennae and a few others immediately in front of the ocelli and behind it. The thick upper occiput is entirely pale yellow pilose. The face is polished shining black, virtually bare, rather produced, the facial knob large, unusually prominent, and rounded, leaving a deep concavity below the antennae. Facial strips extremely and unusually broad, deep shining chestnut, and bare of pubescence; covered more or less uniformly with silvery pile. The antennae are short or of medium size, the first two segments dark brown, somewhat shining, the third orbicular, dark brown above and lighter below with numerous fine pits. Arista short, light brown, thickened upon the basal third, the thickening most prominent upon the basal seventh.

**THORAX:** Mesonotum and scutellum shining black, with a strong greenish cast and almost entirely covered with dense, extremely abundant, not quite erect and rather short brassy pile. On the notopleura are one or two stiff bristles, pale colored. There are three or four black bristles in a row above the wing; none on the postcalli or scutellum or pleura. All the pleural pile is brassy. The scutellar margin is without conspicuous bristles; its pile is of about the same length as that upon the disc.

**LEGS:** Shining black, the tips of the femora, more conspicuously on the first four, the basal two-fifths of the hind tibiae, almost the basal half of the middle pair and basal two-fifths of the anterior pair and at least a fifth of the apex of all pairs orange brown. All the tarsi are brown; the middle basitarsi are barely lighter; the hind basitarsi are almost black. The dorsal pile of all the basitarsi is black. The hind femora are short pilose; most of their lateral pile is black, and there are five or six lateral, basal, short, golden bristles; their ventral pile is entirely black to the base. The hind tibiae are chiefly reddish golden pilose on both inner and outer surfaces and sparse and black pilose ventrally.

**WINGS:** Pale brown throughout, the stigma brownish yellow, the postical cross vein strongly sigmoid, the subapical one with a slight but double bend in the middle, both with strong spurs; the subapical cross vein joins the third vein at right angles to the pre-

apical section and remote from apex of wing. Costal cell, base of subcostal and of submarginal cells barely paler than the remainder of the wing.

**ABDOMEN:** Shining polished black with a greenish cast and somewhat flattened in the middle; it is quite robust and considerably wider than the thorax; the pile is almost wholly pale yellowish white, almost silvery. In the middle of the posterior part of the second and the anterior portion of the third segment there is some quite flat, appressed black hair. The sides of the third, fourth, and fifth segments are considerably curled over.

#### TYPE

Holotype, female, Wyoming, Jenny Lake, May 16, 1924 (A.M.N.H.).

#### *Cheilosia porcina*, new species

Figures 82, 91

Related to *obesa* but with smaller antennae and longer and more shallow facial concavity. Length 9 mm.

#### FEMALE

**HEAD:** Eyes thickly yellowish white pilose on the lower half, becoming brownish black above. The occipital pile is brassy, with a few long black hairs at the top. The pile of the vertex and front is black and short, with considerable brassy yellow pile intermixed but entirely black upon the lower third of the front; all the pile is erect. The front is shining black, with a slight greenish or brassy luster, is granulate, and the ocular margins are punctate and yellowish pubescent upon the lower fourth. There is a faint, linear, medial groove expanded at the bottom of the shallow transverse depression. The antennae are black with a trace of dark reddish brown at the base of the third segment. Third segment with numerous pores and silvery gray pubescence. Arista blackish, microscopically pubescent. The face is moderately concave in profile, the prominent tubercle gently sloping above. The face is brassy black, with rather thick, erect pubescence and with three fairly regular rows of brassy hairs. The face is moderately produced diagonally forward.

**THORAX:** Mesonotum and scutellum brassy black, with erect, moderately long pile which is chiefly brassy yellow but in which there is

considerable fine black pile scattered throughout including the disc of the scutellum. The margin of the scutellum has some longer, black, slender hairs, which are hardly bristles, and numerous shorter golden ones. The pteropleural pile is entirely brassy, but there are 10 or 11 slender black hairs on the upper part of the mesopleura mixed with yellow ones. Squamae white, the fringe pale yellow.

**LEGS:** The femora are black, their apices obliquely yellowish brown. All the tibiae are light yellowish brown, rather sharply marked with black in the middle. The bases of the tibiae are more extensively pale. The black of the middle tibiae begins at the middle. The pile of the hind femora is almost entirely short and golden below with a few very slender black short hairs beginning at the middle and extending distally. The lateral pile is short and brassy, becoming black and appressed on the apical fourth. The first segment of the middle tarsi and the base of the first segment of the fore tarsi are yellowish brown. The hind basitarsi are considerably thickened, and all the basitarsal pile is black.

**WINGS:** Comparatively short and wide and uniformly tinged with pale brown. The stigmal cell is clear yellow, the subapical cross vein nearly straight, the distal portion of the first posterior cell short, the radial sector stalk with two black bristles.

**ABDOMEN:** Broadly oval and flattened and brassy and greenish black. The pile is short, erect, and pale yellowish; it becomes appressed in the middle of the second and third, and subappressed in the middle of the fourth, segments but is of the same color.

#### TYPE

Holotype, female, Oregon, Corvallis, April 15, 1916, McCormack (A.M.N.H.).

#### *Cheilosia speculum*, new species

Figures 12, 89

A shining black species with elongate wings and mixed yellow and black pile upon the mesonotum and legs. The frontal pile is black. Related to *obesa*. Length 8 mm.

#### MALE

**HEAD:** Eyes thickly short white pilose, the upper facets markedly enlarged; the eyes

touch for a considerable distance, the vertex is raised and convex, the ocelli almost touch the ocular margin. The pile within the ocelli and all of the frontal pile, except one or two hairs, are long, sparse, erect, and black. The occipital pile immediately behind the ocelli is long and pale yellow on either side and mixed black and yellow but wholly pale yellow on the lower three-fourths of the occiput. The ground color of the front is shining black and slightly bluish with a very faint, medial impression, and only the ocular margins are narrowly gray pubescent. The front is convex and raised above the ocular margin; the eyes are horizontal at their juncture. Antennae rather small, the first segment black, the second one black and reddish apically with black pile; the third segment is slightly longer than wide, is rounded apically, is reddish along its whole base narrowly, and brownish or reddish black on the remainder, with pale yellow pubescence. The arista is black, basally thickened, without apparent pubescence. The face is polished, shining black with little or no pubescence except narrowly near the eyes on either side. The tubercle is moderately large, more abrupt below than above, where it slopes gently into the low concavity. The face is short, without pile. The facial strips have pale yellow pile and apparently are without pubescence.

**THORAX:** Mesonotum and scutellum shining black, with erect, rather thick, moderately long pile, most of which is pale yellow. There is considerable black pile throughout upon the mesonotum, both in front of the suture and behind, with perhaps a little more upon the notopleura. There is a tuft of black pile at the upper part of the slightly bluish mesopleura and on the pteropleura. The scutellum has only long, thick, erect, whitish pile and is without differentiated bristles. There are two or three longer, slender black hairs on the postcalli.

**LEGS:** Black, the apices of the femora are narrowly and obscurely brown, more yellowish upon the anterior four. The hind tibiae are almost wholly black but are narrowly and obscurely and diffusely brown at both base and apex. The fore and middle tibiae are obscurely brown upon perhaps a fifth basally and apically. All of the tarsi are dark brown, the hind tarsi nearly black. The bases of the



middle basitarsi are lighter in color. Hind femora chiefly yellowish pilose, with considerable long, black pile laterally upon the apical half and with numerous slender black hairs ventrally and some golden ones. Pile of hind tibiae almost entirely blackish laterally but golden throughout ventrally and medially. All of the basitarsi are black pilose above. The anterior femora are thickly, long black pilose laterally down the middle with yellowish pile above and below. The middle femora, however, are entirely yellow pilose laterally except for two slender apical hairs.

WINGS: Quite long and slender, slightly brownish in the middle, the stigmal cell light brownish yellow, the distal section of the first posterior cell quite long, its cross vein without basal spur, the third vein slightly concave basally.

ABDOMEN: Oval but because slightly crumpled it is difficult to tell if the species is as robust as *obesa*; apparently not. It is quite dully shining black over the middle of the second and third segments with slight bluish green sheen, the sides are broadly shining, greenish black, as is the whole of the fourth segment. The pile is appressed and black in the middle of the second and third segments but is entirely pale yellowish and erect on the sides and the whole of the fourth segment, where it is fairly long except on the base.

The fore coxae of this species are slightly angulate but are so broadly rounded that they scarcely deserve inclusion in the *pikoi* group.

#### TYPE

Holotype, male, Colorado, Grand Mesa, July 8, 1938, U. Lanham coll. (A.M.N.H.).

#### *Cheilosia swannanoa* Brimley

*Chilosia swannanoa* BRIMLEY, 1925, Ent. News, vol. 36, p. 73.

We have not seen this species. Its author suggests that it may be related to *florella*; however, it may also be related to *montanipes* or to *baroni*. It is described as follows:

"Male. Eyes hairy; facial tubercle large and prominent; hind tibia with a decided emargination on posterior side near apex; third antennal joint longer than broad; face bare.

"Black, the third antennal joint dark

brown, the legs dark brown, with the following yellow or yellowish, apices of all femora, front tibiae, base and apex of middle and hind tibiae, and first two joints of four anterior tarsi; hind tarsi wholly dusky. All tibiae and tarsi covered with short fulvous pubescence which tends to obscure the ground color. Pile of body rather plentiful, whitish, except on mesonotum, where it is nearly or quite black, and on frontal lunule, where rather long black hairs are mixed with whitish ones; pleura with whitish pile. There are also black bristly hairs above bases of wings and on sides of scutellum, which latter has also a fringe of white hairs on the posterior margin.

"Wings pale sooty, a little more yellowish at base and with stigma yellowish. Calypteres whitish, halteres dark at tip.

"Length 9 mm., wing 7 mm.

"Runs in Shannon's key to the genus (Insec. Inscit. Men., X-127, 1922) to *florella*, but has the wings pale fuscous, and the antennae and pile on mesonotum dark."

#### DISTRIBUTION

Holotype, male, North Carolina, Swannanoa, September 5, 1924, C. S. Brimley coll. (U.S.N.M.).

RECORDS BY OTHERS: None.

#### *Cheilosia hunteri* Curran

Figures 22, 53

*Chilosia hunteri* CURRAN, 1922, Canadian Ent., vol. 54, p. 17.

A moderately brassy black fly with black frontal pile in the male and brassy pile in the female. Antennae light orange brown, the face pubescent. Related to *florella*; the tibiae are widely black centrally and there is some black pile upon the thorax.

#### MALE

Length 8 mm.

HEAD: Pile of eyes dark brown and sparse, absent on the lower half. The pile of the upper and lower occiput is entirely pale yellow, with about six long, black hairs between the ocelli; the pile of the front is long and erect and entirely black. The antennae are small, the first two segments brown; the third segment is subquadrate, though quite broadly rounded dorso-apically, and orange brown in color;

arista brown and microscopically pubescent. The face is black, moderately shining, the tubercle medium sized, the concavity moderate. The facial strips are both pubescent and white pilose. The face is thinly pubescent without pile.

**THORAX:** The mesonotum and scutellum are shining black, with a very faint, slight, brassy cast; the pile is nearly erect and moderate in length and pale yellowish white with considerable black pile mixed in upon the notopleura just above the wing and on the postcalli. The upper part of the mesopleura is thick black pilose; pteropleura black pilose. There is no black pile upon the scutellum and no bristles; the pile is erect and pale yellowish and scarcely longer upon the margin.

**LEGS:** Dark brownish black, the apices of the femora narrowly yellowish brown; the basal third of the hind tibiae and anterior tibiae and basal half of middle tibiae and the apical sixth of all the tibiae are light yellowish brown. The tarsi are dark brownish black, all the segments with black pile above. The hind femora are almost entirely black pilose ventrally upon the sides and dorsally; at the extreme base there are a few golden hairs laterally and a few ventrally. The pile of the tibiae is black but narrowly golden along the medial surface and ventrally at the apex.

**WINGS:** Pale brownish hyaline, the stigmal cell yellowish, the distal section of the first posterior cell long. The subapical cross vein joins the third vein remote from the apex of the wing.

**ABDOMEN:** Oval and considerably flattened and brassy black. The pile is short, yellowish white, and broadly erect along the sides, but down the middle of the second and third segments it is suberect with a few appressed hairs. All of the pile appears to be pale. The pile is also subappressed in the middle of the posterior portion of the fourth segment.

#### FEMALE

**HEAD:** Eyes very sparsely short pilose and almost bare, the pile of the front and vertex and occiput entirely pale yellowish white and sparse and short. The front is shining black, and within the middle there is a faint greenish brassy tinge. There are two straight submarginal shallow punctate grooves, one on each side of the front, and the sparse granulations

of the front are not prominent. On the lower third there is a very narrow, quite shallow, transverse excavation connected anteriorly with an equally shallow medial groove and central pit. The antennae are small though a little larger than in the male; on the third segment they are considerably longer below than above; the last two segments are light orange brown, the third with seven or eight punctures; arista brown. The face is considerably more deeply excavated than in the male and in both sexes produced about as much downward as forward. The face is thinly pubescent, widely bare in the middle and without pile.

**THORAX:** The mesonotum and scutellum are very short pilose, the pile subappressed and almost entirely light yellow though sometimes reddish. There may be some black, very short pile in the middle of the mesonotum and a tuft of black hairs immediately above the wing which are quite short. The pteropleural pile is pale, and there are only one or two black hairs on the upper part of the mesopleura, and these may be absent. The scutellum is also very short pilose, the pile entirely pale or reddish except for two or three scarcely discernible short black hairs along the sides.

**LEGS:** Similar to those of the male, but with more short golden pile laterally along the sides of the femora and throughout the entire dorsal length except near the apices.

**WINGS:** Similar but darker brown, especially in the middle, and with the distal section of the first posterior cell considerably shorter than in the male.

**ABDOMEN:** Very short pilose; the pile is quite flat appressed and lies right on the surface. The abdomen is brassy black, wider and more convex than in the male; the pile appears to be entirely pale, the only erect pile being on the sides of the first and second segments and laterally upon the basal margin of the second segment.

#### DISTRIBUTION

Holotype, Manitoba, Teulon; Winnipeg, five males (C.N.C.).

**MATERIAL REVIEWED:** Homotypes, two males, one female, Teulon; one individual, Alberta; two, Washington State.



the same length as the other pile. Scutellar pile wholly pale yellowish white, erect, and but little longer on the margin. Scutellum shining black. Pleural pile pale, two or three black hairs on the upper pteropleura and a larger tuft on the upper part of the mesopleura.

**LEGS:** Moderately shining black, the hind femora with the apex narrowly brown; other femora narrowly brown on the posterior apical side, more extensively so on the anterior apical side. Hind tibiae with basal two-fifths, middle tibiae with at least basal half, and anterior tibiae with almost basal half, light yellowish brown. The apical eighth or more of hind tibiae and somewhat more of the fore and middle tibiae similarly colored. All the tarsi black, middle basitarsi dark brown along the sides. All of the tarsal pile black above, extensively so. Apparently no black setae on the lateral sides of hind basitarsi. Pile of hind femora short, the short setaceous ventral pile extensively black almost to base and abundant. The apical pile entirely black and the lateral pile on the basal half and the subdorsal pile almost to apex golden.

**WINGS:** Strongly brownish in the costal and the basal cells except their middle; the base beyond the basal cells and the basal halves of the submarginal and the marginal cells from the beginning of the submarginal cells all darker brown. The posterior half of the wing considerably paler, virtually hyaline; stigma brown; subapical cross vein slightly sinuous, not quite but almost forming a rectangle with third longitudinal vein joining it rather remotely.

**ABDOMEN:** As broad as thorax, thickly pale yellow pilose, the pile suberect on all of second, third, and fourth segments. No black hairs in the middle of third segment. Pile on the middle of all the segments considerably more appressed but not flat.

#### DISTRIBUTION

Type, Minnesota, Itaska Park, one male (U.M.).

**MATERIAL REVIEWED:** Type, and Alberta, Cooling Lake, one male; Banff, one male, May; Washington, Tipsoo Lake, one male, July.

**RECORDS BY OTHERS:** None.

#### *Cheilosia florella* Shannon

##### Figure 42

*Chilosia florella* SHANNON, 1922, *Insecutor Inscitiae* Menstruus, vol. 10, p. 138.

The authors studied the types of this species, and to the brief original description given below we add additional notes from the types.

#### MALE

Less than medium size, greenish black in color; clothed with pile entirely luteous in color; eyes hairy; face bare; a few long and very slender hairs, besides the usual pile, on scutellum which are also luteous in color; antennae and arista yellowish brown; third segment small, about twice as large as second; arista fairly short, bare; face moderately concave between the eyes and tubercle; tubercle prominent, not extending as far as base of antennae. Femora black, darkened at their apices; tibiae yellow, broadly darkened in the middle; tarsi brownish. Abdomen but little opaque on second and third tergites. Wings luteous throughout, more deeply so basally; squamae white; halteres reddish brown. Length 7.5 mm., wing 6.5 mm.

#### FEMALE

Of medium size, otherwise similar in general appearance to the male. Antennae reddish yellow; third segment about four times as large as the second; arista subequal to width of frons at antennae; face rather deeply excavated; tubercle pronounced and extending beyond antennal base. Legs with color pattern similar to that of male but more orange. Wings rather broad, luteous. Length 8.75 mm., wing 7.25 mm.

#### DISTRIBUTION

Idaho, Moore's Lake, one male and one female (U.S.N.M.).

**MATERIAL REVIEWED:** The types.

**RECORDS BY OTHERS:** None.

This species is a wholly pale yellow pilose fly, with the front, mesonotum, and abdomen unusually strongly brassy in color. The face, however, is blackish and quite pubescent. The facial strips are long, pale pilose. The antennae we would describe as pale orange, the short arista brown. All tibiae are almost wholly bright light orange with a small faint

trace of brown in the middle; ends of femora widely tipped with lighter color; the ocular pile is long and pale. The brassy margin of the scutellum is without any trace of differentiated bristles; all scutellar pile dense and erect. There are no black bristles ventrally on the hind femora.

This species is related to *hunteri*, which, however, has the tibiae more widely black in the middle, has some black pile upon the mesonotum and pleura, though very little in the female. Moreover, if we are correct in our diagnosis of *hunteri* in the female sex, these females are short, flat-appressed upon the abdomen, strongly in contrast to *florella*.

***Cheilusia cratorhina*, new species**

Figures 18, 66, 94

A yellow to golden fly related to *florella* Shannon but with the face strongly produced forward. Length 8.5 mm.

**FEMALE**

**HEAD:** Eyes thickly pale yellow pilose, becoming light brown above; the occipital, vertical, and frontal pile is entirely erect and shining yellow and only moderately long. The front is thickly granulate, the ocular margins punctate and yellow pubescent on the lower sixth or less of the front. The front is without linear groove, though there is a linear bare space and the transverse excavation is very shallow and lies immediately in front of the antennae. The first two segments of the antennae are reddish brown; the third segment is orange brown, circular, and its apical margin is a little darker. The arista is light brown at the base, dark brown outwardly and basally thickened and microscopically pubescent. The face is shining black, faintly brassy or greenish, and is strongly produced forward with a very prominent tubercle which is equally abrupt above and below and extends beyond the antennae. The face is thus considerably concave although nearly vertical beneath the antennae.

**THORAX:** Shining greenish black including the scutellum; the pile is quite dense, erect, and brassy yellow with a slight brownish tinge; the margin of the scutellum has four or five pairs of slender, fine, bristle-like hairs mixed with shorter ones; the only black hair on the thorax is a single one over the root of

the wing and one hair upon one postcallus.

**LEGS:** Femora sepia brown, the apices yellowish brown, the tibiae light yellowish to orange brown and dark brown in the middle but not extensively. The pile of the hind femora is entirely short and golden below and on the sides and above, except laterally at the extreme apex, where there are a few slender black hairs. The pile of the hind tibiae is entirely golden except for a few short black hairs along the dorsolateral margin and laterally near the apex. The first segment of the middle tarsi and the base of the first segment of the fore tarsi are yellowish brown, the remaining tarsi dark brown and becoming quite blackish upon the last two segments. Hind basitarsi not thickened and all the basitarsal pile black.

**WINGS:** Of moderate length, but the distal section of the first posterior cell is quite short; whole wing rather strongly and uniformly tinged with brown, stigmal cell yellow, subapical cross vein slightly sinuous.

**ABDOMEN:** Rather wide and flattened but very little wider at the end of the third segment than at the end of the first segment; the pile is everywhere golden yellow, of moderate length and erect except that it is appressed in the middle of the second and third segments and subappressed in the middle of the fourth segment.

**TYPES**

Holotype, female, Oregon, Mary's Peak, May 9, 1914, H. Currey (A.M.N.H.); and one paratype, female, June 19.

***Cheilusia borealis* Coquillett**

Figure 45

*Chilosia borealis* COQUILLET, 1900, Proc. Washington Acad. Sci., vol. 2, p. 426.

Very small black flies with small antennae which are almost entirely black on the male and reddish brown on the female. Face produced diagonally downward. The facial tubercle is quite low, and the face is very little excavated above, but abrupt below the tubercle on the male; on the female, the face is very highly polished and considerably excavated above the tubercle. The pile of the male generally black with rather long hairs, which are almost bristle-like, on the edge of the scutellum. Pile on the mesonotum is generally

black along the sides but with considerable yellowish pile on the disc and some black hair intermixed. The pile along the sides of the abdomen is also mostly yellowish. On the female, the pile is mostly whitish yellow on the front and abdomen and the abdomen is quite wide; on the mesonotum quite short and mostly yellowish but not appressed. Related perhaps to *florella*. Length about 7 mm.

#### MALE

**HEAD:** Pile of eyes thick, rather long, and dark brown. The vertex and front are shining black, the latter without pubescence and both with long, erect, black pile. However, behind the vertex upon the occiput there are shorter, pale yellow hairs. The front is microgranulate, and the frontal lunules at the extreme anterior margin of the front are brown. Antennae throughout dark, reddish sepia brown; the arista is basally thickened and microscopically pubescent on the basal half. The antennae are small in size; the third segment is nearly as deep as long. The face is shining black with considerable inconspicuous whitish pubescence on the sides of the lower part; strips both pilose and pubescent. The face is produced forward below, the tubercle is set low upon the face, and its elevation is low, leaving the face gently concave above.

**THORAX:** Mesonotum and scutellum shining black with rather long, only moderately thick, erect pile. Along the anterior margin of the mesonotum and again just before the scutellum and down the middle the pile is pale yellow. The pile is entirely black, widely upon the sides and the postcalli and wholly upon the scutellum and its margin. The ventral scutellar fringe, however, is long, thick, and yellow. The marginal pile of the scutellum is longer but so delicate as to be scarcely bristle-like. There is a pronounced transverse depression in front of the margin of the scutellum. Pleural pile chiefly black with some yellowish hairs anteriorly upon the mesopleura.

**LEGS:** The femora are brownish black, the apices narrowly yellowish brown; ventrally on the hind femora the stiff black pile extends almost to the base, being replaced there by yellow pile. There is black pile laterally upon the whole outer half and dorsally upon the apical fourth where there are several long,

slender, black, bristly hairs. The tibiae apically and basally are rather light yellowish brown but extensively sepia brown on both sides in the middle with black pile upon this area except ventrally and medially. All of the tarsi are brownish black, the hind basitarsi black pilose.

**WINGS:** Tinged with pale brown, especially before the small cross vein. Stigmal cell yellow, the lower cross veins both spurred; first posterior cell long, the subapical cross vein joining the third vein rather remote from apex and joining the pre-apical section at right angles; the third vein somewhat curved.

**ABDOMEN:** Flattened, rather elongate and slenderly oval, and moderately shining black, more shining upon the fourth segment. The pile is entirely yellowish and is appressed down the middles of the second and third segments, subappressed centrally upon the fourth segment.

#### FEMALE

**HEAD:** Eye pile pale whitish brown; vertical pile sparse, short, black, the whole of the frontal pile whitish, abundant, and nearly erect. The front is broad, the lunate area on either side faintly marked but minutely pitted, the whole front shining brownish black. Antennae similar to the male; the face similar, ranging from shining brown to black.

**THORAX:** Mesonotum similar except that the entire pleural pile and the whole of the mesonotal pile, except for two or three black bristles above wing base and two on postcalli, are entirely light yellow and nearly erect. They might be described as subappressed. The scutellar discal pile is subappressed and yellow and among the short yellow marginal hairs are three pairs of slender, black bristles, the medial pair longer.

**LEGS:** Similar to those of the male in every respect.

**WINGS:** Similar to those of the male except that the first posterior cell is not long and slender. The apical section beyond the basal spurs is perhaps only from one-half to two-thirds as long as it is in the male.

**ABDOMEN:** Flattened but rather broadly oval, considerably wider than the thorax, and very dark, shining reddish sepia brown. The pile is wholly pale but is short, sparse, and flat-appressed except quite narrowly along



the basal margin on each side of segments two, three, and four.

#### DISTRIBUTION

Type, Alaska, Kukak Bay, Yakutat, Kodiak, Virgin Bay, Saldovia, four males and 17 females (U.S.N.M.).

MATERIAL REVIEWED: The type, and Alaska, Katmai, three males, June. Also two individuals from Oregon and one from Alberta.

RECORDED BY OTHERS: Oregon, Corvallis, doubtful, Cole-Lovett.

***Cheilosia borealis nigroseta***, new subspecies

#### FEMALE

This subspecies is distinguished by the fact that the face has a small tubercle, not quite so low, equally abrupt above and below, there is more pubescence, and the face is shorter upon its diagonal axis. The pile of the mesonotum is a little longer, a little whiter, a little more delicate, and a little more erect. On the abdomen there is much appressed, very short, setate pile, black centrally upon second, third, and fourth segments, though on the fourth segment it is confined to the basal half.

LEGS: Similar but without any black pile ventrally on the hind femora or their tibiae.

WINGS: Pale brownish hyaline, the venation more or less similar to that of *borealis*, based on two females from Cameron Pass, Colorado.

#### TYPES

Holotype, female, and paratype, female, Cameron Pass, Colorado, July and September, respectively (Hull coll.).

This subspecies is not included in the key, as it was not discovered until after the original manuscript had been completed and most of the specimens discussed returned to the institutions to which they belong.

***Cheilosia montanipes***, new species

Figures 26, 62, 92

Brassy black species with long brown pilose eyes. Antennae small and dark in color. Mesonotum and abdomen largely pale brown pilose. Distinguished from *cottrelli* by the shallowly excavated face. Length 8.5 mm.

#### MALE

HEAD: Eyes densely light brown pilose, the

pile rather long, the front abundantly long black pilose, the medial impression distinct, reaching to the eye junction. The front is covered with pale grayish pubescence, obscuring the ground color; the vertex is black pilose. The face is shining black, extensively pubescent including the cheeks but not the lowest angle to the epistoma. The facial tubercle is deeply concave beneath, more gently so above, pubescent and rather prominent. The antennae are small; the first segment is dark brown, the second and third somewhat lighter, the base of the third narrowly reddish below; arista slightly thickened on the basal third, its pubescence quite short. Facial strips moderate in width, pubescent, and broadly white pilose.

THORAX: Mesonotum shining black with a strong brassy luster, the pile long, quite abundant, fine, and delicate, chiefly pale brownish white with some fine black hairs intermixed; on the notopleura are numerous black hairs. There is an extensive row of black hairs above the base of the wing, a group on the postcalli out of which arise some three much longer ones, also slender. The scutellum is concolorous, flattened before apex, broadly rounded, with the pile erect, and the pile upon the disc, except the extreme sides, is wholly pale brown, almost white. On the margins are numerous very long, quite slender, bristly hairs set in minute tubercles and intermixed with somewhat shorter pale ones.

LEGS: Shining dark brown, the apices of the femora narrowly lighter, the narrow bases of the hind tibiae, the basal third of the middle tibiae, and about the same extent of the anterior tibiae dark brown. The apices of these tibiae are narrowly brown. All of the tarsi are brown, their dorsal pile is black. Pile of the hind femora long, pale yellow, on the basal ventral half, laterally on the basal half, and almost to the apex in the long dorsal and subdorsal fringe of hair. The black ventral hair of the apical half is long and delicate instead of short and stubby. The pile of the hind tibiae is golden on the inner surface and basally and apically on the outer surface, in the middle of which it is very dark brown, perhaps black; the ventral pile is somewhat dark.

WINGS: Uniformly pale brown, scarcely darker anywhere unless in the costal and base

of marginal and submarginal cells. Stigma brown, wings much longer than abdomen; the subapical cross vein is long, without spur, and joins the third longitudinal vein at somewhat less than a right angle, the extreme region of junction perhaps being right-angular. The postical cross vein is straight and spurred.

**ABDOMEN:** Somewhat slender, concolorous with dorsum, the pile semi-erect, almost wholly erect on the third segment and the sides of the other segments but broadly subappressed throughout the center of the second and third segments. Most of the pile is pale yellow or brown, but there is a limited area in the center of the second segment posteriorly and again in the third segment which is very dark brown or black.

#### TYPE

Holotype, male, Colorado, Mineral County, 10,800 feet (A.M.N.H.).

#### *Cheilosia hesperia* Shannon

*Cartosyrphus hesperia* SHANNON, 1922, *Insecutor Inscitiae* Menstruus, vol. 10, p. 132 (in key only).

A slender, black species with dense, short, black thoracic pile. Related to *montanipes*. Length 8 mm.

#### MALE

**Head:** Ocular pile thick and dark brown, extending to the bottom of the eye. The front is granulate, shining black, short, erect black pilose and without pubescence and with a conspicuous pit just in front of the dark brown callosity which is without groove. The vertex and upper occiput are black pilose, the latter with some shorter, paler pile. The front is black, moderately shining, thickly whitish pubescent, and without pile; the tubercle is short, but rather narrow viewed from in front; the concavity is quite long and deep and rather shallow; the whitish pubescence is dense beneath the antennae and still more so upon the outer ocular half of the lateral upper triangles of the face. The antennae are brown; the first segment is dark, the second segment light, the third segment small and light chestnut brown; arista brown, slightly thickened basally, without evident pubescence. Facial strips gray pubescent and yellowish gray pilose.

**THORAX:** Mesonotum and scutellum shin-

ing black, perhaps faintly greenish or brassy in front of the scutellum. The pile of the mesonotum is wholly black, very dense, slightly subappressed, and of only moderate length. It is considerably shorter than in *pilosipes*. The pile of the pleura is black with a few yellowish hairs below. Scutellar pile thick, black, subappressed but with golden pile narrowly along the base, and the ventral fringe is golden. There are no differentiated bristles upon the margin. Squamae, its fringe and pile and the plumulae pale yellow. Halteres yellow, their knobs red with brown center.

**LEGS:** Dark brown, nearly black upon the anterior femora, the apices of all the femora light brown; the pile of the hind femora is brassy laterally upon the basal third and is short and brownish black on the distal portion, though with two or three longer, slender, golden hairs. The ventral pile of the hind femora is largely blackish, with a little short, golden pile near the base; the tibiae are dark brown, the extreme apex and the basal fourth yellowish brown. The pile of the hind tibiae is blackish but golden over the whole medial surface. All of the tarsi are black and black pilose above; the hind basitarsi appear to be a little enlarged and rather flattened dorso-ventrally.

**WINGS:** Uniformly pale brownish hyaline, the stigmal cell light yellowish brown; the subapical cross vein joins the third vein remote from the apex, leaving the last section of the first posterior cell short. The radial sector stalk has three long, slender, black bristles.

**ABDOMEN:** Slenderly oval and convex and tapering posteriorly; the second segment is slightly flattened in the middle, the color of the abdomen is shining black with a brassy reflection. The pile is moderately short, erect on first and second segments, not quite wholly erect on third and fourth segments and everywhere light brassy yellow except for four or five black hairs on the apical margin of the fourth segment and small tuft of black hairs on the apex of the hypopygium.

#### DISTRIBUTION

Alaska, Old Crow, male, June 18, 1920, Jessup coll. (U.S.N.M.).

**MATERIAL STUDIED:** The type and one male (which is believed to be from the type material).

This species was mentioned by Shannon only in his key and has never been described. He also credited it to *Cartosyrphus*, but in the specimen studied the ocular pile is abundant.

***Cheilosia baroni* Williston**

Figure 43

*Chilosia baroni* WILLISTON, 1886, Bull. U. S. Natl. Mus., vol. 31, p. 40.

A slightly greenish black, rather large species in which the pile on the front of the male is black. Female front roughly granulate; antennae sepia; tubercle large, low; face strips pubescent and pilose. On the mesonotum the pile is yellowish with black bristle-like hairs along the side. In the female the pile of the head, thorax, and scutellum is entirely whitish, with rarely a few black hairs on upper occiput. On the scutellum the pile is black and white mixed on the disc with rather strong, bristle-like hairs on the rim. There is a distinct pre-apical depression on the scutellum. On the female, the pile is all pale except a few black hairs above the wing base and rather broadly on the discs of the second and third abdominal segments. The pile of the eyes is virtually all white. Perhaps related to *orilliaensis* through the appressed pile of the abdomen. Length 9 to 11 mm.

**DISTRIBUTION**

Type, Washington, California, one male, three females (U.S.N.M.).

**MATERIAL REVIEWED:** Type, and Washington, Puget, one female; Ellensburg, one female; Oregon, Stein Mountains, one male; New Port, one female, compared with type; Colorado, Grand Mesa, two females.

**RECORDED BY OTHERS:** Oregon, Mary's Peak, Cole-Lovett.

***Cheilosia hiawatha* Shannon**

*Chilosia hiawatha* SHANNON, 1922, Insector Inscitiae Menstruus, vol. 10, p. 138.

A nearly bare black species with a large rounded tubercle and strong black bristles on the scutellum. Eyes of the female bare, but the antennal pits are definitely separated by a strong chitinous bridge. Legs quite short pilose, wings strongly tinged with yellow, especially in the female. Belongs to the *bigelowi* group. Length 10.5 mm.

**MALE**

**HEAD:** Antennae small and, together with the basally thickened, basally short pubescent arista, black. The face, front, and vertex are shining black. The face is polished and bare except for a little yellowish pubescence below the tubercle and above the posterior angles of the epistoma. There is some pubescence just in front of the cheeks where the face bulges outwardly. The facial tubercle is large, the concavity deep, the strips densely grayish white pubescent and sparsely white pilose. The pile of the front and vertex is erect and long and black, the front bare of pubescence, granulate, and with a rather deep medial crease expanded into a flattened triangle in front of the antennae. The antennal callus is black, the upper occipital pile black.

**THORAX:** Mesonotum and scutellum shining black with moderately long, thick, fine, erect black pile, becoming still longer upon the margin of the scutellum which has three or four pairs of quite long, stiff hairs. Ventral fringe yellow. The pile of the pleura is abundant, long, and entirely black. The squamae are pale brown, with yellowish brown fringe and border.

**LEGS:** Black and black pilose, the medial pile of the hind tibiae, which are reddish to golden brown pubescent over much of their surface, is brassy. The ventral pile of the hind tarsi and of the fore tarsi brassy. Upon the fore legs the first and last segments of the tarsi are black, the intervening three segments rather light yellow and contrasting. Upon the last four legs the first two segments and the last segment of the tarsi are black; the intervening segments of the hind tarsi are nearly black, of the middle tarsi dark brown. The femora are black to their apices, the tibiae to their bases.

**WINGS:** Deeply tinged with brown though diffusely over the basal half, becoming paler posteriorly and apically; the stigmal cell is no darker than the costal cell; the radial sector stalk has five long, slender, black bristles.

**ABDOMEN:** Rather shining black, somewhat more dull on the second segment where there is a slight bluish reflection but becoming rather brassy in reflection upon the fourth segment. Abdomen narrowly oval, somewhat flattened basally, and with erect yellowish

pile on the second segment, erect and longer on the sides of the third and whole of the fourth segment, but is long, sparse, appressed, and reddish yellow on the middle of the third segment; there is no black pile on the abdomen. On the black, large, gray pubescent hypopygium the long pile is yellowish with three or four black hairs.

#### FEMALE

HEAD: Everywhere shining black, the face very lightly coated with white pubescence which is heavier along the facial strips, appearing as white patches near the antennae, and also extending as a narrow triangular patch onto the front. The facial tubercle is well rounded and prominent. Front rather long, shining, and with three shallow sulci, the pile white with a few black bristles down the middle and on each side of the antennae, but all black around the ocelli. Antennae reddish brown, quite roundish in outline, the two basal segments black; arista reddish brown, quite pubescent.

THORAX: Mesonotum shining black with short, stiff, partly appressed, black pile; some white hairs on the humeri and on the notopleura, also posteriorly on the mesonotum. There is a strong black bristle on the notopleura, several on the postcalli, and several just above the wing base; one strong black bristle and two or three short ones on the posterior upper corner of the mesopleura.

LEGS: Mostly black or very dark brown, the middle segments of the front tarsi somewhat yellowish.

WINGS: Considerably tinged yellowish brown.

ABDOMEN: Shining black with flat appressed pile except for long yellowish hairs on the sides of the first two segments.

#### DISTRIBUTION

Type, Massachusetts, Forest Hills, one male (U.S.N.M.).

MATERIAL REVIEWED: Type, and Massachusetts, Lexington, one female; Holliston, one female; East Gloucester, one female, June 14, 1929, C. W. Johnson.

RECORDED BY OTHERS: Massachusetts, Danvers, Wayland, East Gloucester, Johnson.

#### *Cheilisia pilosipes*, new species

A slender black species with very long thick pile on the mesonotum and scutellum, with low facial tubercle and very shallow concavity. Length 8 mm.

#### MALE

HEAD: The pile of the front and vertex and upper occiput is long and black; the front has abundant gray pubescence and a medial crease which largely divides the dark brown callus. The black face is without pile, the pubescence extensive but absent on the tubercle at its apex, and longer and slightly yellowish on the sides of the face and above the cheeks. The tubercle is low and short, moderately abrupt below, but above it slants very gently and gradually down to the almost absent shallow concavity. The facial strips are pubescent and yellowish white pilose, the bulk of their pile lies in a single outer row. The antennae are small, the quite short first segment is dark brown, the second segment lighter, the third segment light yellowish brown, its apical and dorsal border narrowly darker brown. The arista is blackish, thickened on the basal half, and micropubescent.

THORAX: The mesonotum and scutellum are shining black with very long, thick, erect, brownish black, fine pile in which there appears to be a little pale brownish or brownish yellow pile, particularly in the anterior middle of the mesonotum. The pleura are dark brown pilose with some pale pile below. The pile of the scutellar margin is longer but very slightly stiffer; it cannot be said to have differentiated bristles.

LEGS: Blackish, the apices of all the femora narrowly light brown, the pile of the hind femora is chiefly black laterally and ventrally with laterally a series of long, slender, yellow bristles that are pointed downward. Ventrally there is some yellow pile on the basal third which is fairly long. The anterior tibiae are yellowish brown on the basal fourth and narrowly and diffusely at their apex. The middle tibiae are similar, and the hind tibiae are scarcely less dark at the base or apex than in the middle. Their pile is black except that it is brassy over the entire medial surface. All the tarsi are black, their dorsal pile entirely black except that the medial as well as the ventral pile of the hind basitarsi is brassy.

WINGS: Pale brownish hyaline, the apical section of the first posterior cell long, its base without spur, the stigma yellowish.

ABDOMEN: Slender and shining black with, in places, a slight bluish green reflection on the second segment. The pile is erect on the sides of all the segments and fairly long but becomes shorter and rather appressed on the middle of the second and third segments. In color it is pale yellowish white along the sides, becoming light brown medially, and with a few short black hairs in the middle of the posterior part of the third segment; the pile of the fourth segment is particularly long, especially on the sides.

#### TYPES

Holotype, male, and one paratype, male, Colorado, National Park, July 1, 1932 (holotype, C.S.C.).

*Cheilosia nannomorpha*, new species

Figures 44, 70, 116

Very small, shining black species, the antennae almost black; pile of the mesonotum white and erect pile of scutellum entirely pale. Related to *bigelowi* but much smaller and with dark antennae. Length 6 mm.

#### FEMALE

HEAD: Front and face shining black, with perhaps some brassy reflection. The front is rather convex with a short, medial impression just before the anterior margin. The pile of the front is about half silvery, the rest consists of longer, slender black bristles. Ocular pile entirely silvery. Face with a small tubercle and shallow excavation above it; there is some very short brownish pubescence. Pile of facial strips abundant and whitish. Antennae almost black, the third segment orbicular, the arista quite short, scarcely two times as long as third segment, the base strongly thickened.

THORAX: Shining black, the pile almost wholly silvery and erect; two or three slender black bristles may be discerned on the anterior part of the mesonotum. The scutellar pile is wholly silvery, without bristles on the margin; the marginal pile is a little longer than the discal pile. Pleural pile, except one black bristle above pteropleura, wholly pale.

LEGS: Black, the hind femora slender, the apices of each femur very narrowly, the

basal fourth of the hind tibiae, more than the basal third of the middle tibiae, and somewhat less of the anterior tibiae, dark reddish brown. The apices of the tibiae are narrowly of the same color. The tarsi are dark brown, the middle basitarsi somewhat lighter. Pile of hind basitarsi chiefly golden brown with one or two rows of black bristles.

WINGS: Pale brown including the stigma. The subapical cross vein is slightly curved and has a short basal spur.

ABDOMEN: Oval, shining black, a little wider at the end of the second segment than the thorax. The abdominal pile is chiefly whitish, appressed in the posterior corners of the third and fourth segment, with considerable appressed black pile in the middle of these segments.

#### TYPE

Holotype, female, Colorado, Grand Mesa, July 10, 1938, U. Lanham (A.M.N.H.).

*Cheilosia canada*, new species

Characterized by the whitish pile throughout, the narrow but prominent tubercle of the face, and the scant, short, appressed, black pile on the middle of the second, third, and fourth segments. Related to *cineralis* but larger and with black pile on the hind basitarsi. Length 9.5 mm.

#### MALE

HEAD: Eyes with rather abundant yellowish white pile, the face and front greenish black, the former with a well-developed tubercle and moderate excavation above it. The sides of the face are thickly yellowish pubescent, the facial strips apparently pubescent on the medial half and bare on the outer half, but whitish pilose. The pile of the front and vertex is long, pale, yellowish white, the front bare on the medial anterior triangle. The antennae are brown, the third segment reddish orange, tipped with dark brown. The arista is short, basally thickened, and microscopically pubescent.

THORAX: Mesonotum shining black, faintly bluish or greenish, the thick pile erect and wholly pale yellowish white; that upon the scutellum is somewhat longer, especially so upon the margin. There are no bristles. Pleural and scutellar pile also wholly pale.

**LEGS:** Shining black, the whole of the posterior tibiae except the extreme base, the middle tibiae except the very narrow base of the apex, anterior tibiae except extreme apex and basal fifth, black; elsewhere the tibiae are brown. Tarsi black, the metatarsi black above; the hind femora are short, black pilose ventrally on all except the basal third, their lateral pile, except the extreme apex, and dorsal pile thick, abundant, rather long on the sides, and pale yellow. Fore coxae bluntly angulate, without spur.

**WINGS:** Pale brown, slightly darker in the middle, the stigma yellow, the subapical cross vein sinuous with a short spur.

**ABDOMEN:** Elongate, slightly oval, shining black, like the thorax with a slight bluish or greenish cast; the pile is of moderate length, very abundant and, except down the middle of the abdomen, is wholly erect and pale whitish yellow. In the middle of the second and third segment the pile is appressed and blackish. There are a few black, suberect hairs in the middle of the fourth segment.

#### TYPE

Holotype, male, British Columbia, Cranbrook, May 10, 1921, C. Garrett (Hull coll.).

#### *Cheilosia columbiae* Curran

Figures 20, 28, 60

*Chilosia columbiae* CURRAN, 1922, Canadian Ent., vol. 54, p. 69.

An elongate oval, greenish black fly of moderate size with chiefly yellowish white pile and dark brownish black antennae; related to *bigelowi* Curran.

#### MALE

Length 9.5 mm.

**HEAD:** Ocular pile pale brown to almost white throughout the entire eye; it is rather thick but of moderate length. The upper occipital pile is entirely whitish. The pile of the vertex and front is long and erect and entirely white except for one or two black hairs on the vertex and three or four upon the front. The first two segments of the antennae are shining brownish black; the third segment is nearly black, the basal half reddish black, its pubescence yellowish white; the arista is short and black and microscopically pubescent. The face is short and black, nearly bare and with-

out pile, the concavity quite shallow, the tubercle small to medium sized and gently sloping above. Facial strips with pale pile and without pubescence. The front is depressed medially but without marked groove, very thickly granulate except on the sides.

**THORAX:** Mesonotum and scutellum shining black with perhaps a trace of greenish luster. The pile is moderately long, erect, fine, delicate, and yellowish white. There are two long, slender, black hairs over the wing, two on postcalli, one on the upper mesopleura, but none on the scutellum. Scutellar pile on the margin considerably longer but very fine and delicate and scarcely differentiated as bristles.

**LEGS:** Black, the apices of the femora with only the extreme tip brown. Hind tibiae with extreme base brown, middle and anterior tibiae with basal seventh brown and a suggestion of dark brown at their extreme apices. The tarsi are blackish with black pile throughout. The hind femora have rather long, whitish pile laterally except at the apex where it is thick and black and with short, white pile dorsally except at the extreme apex; ventral pile on the apical half is black, on the basal half yellowish. The pile of the hind tibiae is chiefly black with some pale yellow hairs laterally on the distal half and with pale pile at least narrowly over the entire medial surface. The fore coxae are angulate.

**WINGS:** Pale brownish, the stigmal cell yellow; the distal section of the first posterior cell is rather long; the subapical cross vein has a spur.

**ABDOMEN:** Elongate, slenderly oval, and shining black; it is dull in the middle of the second segment, more polished on the sides and the whole of the fourth segment and slightly greenish black on the sides. The pile is quite thick and chiefly erect and pale yellowish or brownish white except for a considerable amount of black, subappressed pile in the middle of the second, third, and fourth segments; it is most extensive on the third segment where it occupies a large triangle.

#### FEMALE

**HEAD:** Pile of front and vertex quite thick, fairly long, yellowish white, and not quite erect. The front is flattened, brassy black, and thickly granulate with a medial groove



only on the lower third; the groove is quite narrow and not conspicuous. The ocular punctate areas are long and narrow. The first two segments of the antennae are dark brown; third barely longer than wide, light orange red or reddish brown, with the apex narrowly blackish. The arista is black, microscopically pubescent, and basally thickened. The face is shining black, thinly pubescent, and without pile; the tubercle is large and considerably produced, the concavity moderately weak. The tubercle descends abruptly above as well as below.

**THORAX:** Mesonotum and scutellum shining black with brassy or greenish cast and with quite thick, moderately long, suberect, shining yellowish white pile. There are no black hairs anywhere on the thorax; the scutellar pile on the disc is appressed towards the center. On the margin there are four or five pairs of longer, quite slender hairs; two of them are longer than the others; they are scarcely bristles.

**LEGS:** Black and similar to those of the male, the brownish areas of the tibiae no lighter and a little more extensive on the middle of the anterior pairs. The upper pile of all the tarsi is blackish except for a few golden hairs at the dorsal base of the hind basitarsi. The pile of the hind femora is entirely pale apically and dorsally though rather short, and there are fewer black setae ventrally on the apical half. The pile of all the tibiae is entirely pale.

**WINGS:** Brownish hyaline, the distal section of first posterior cell shorter than in the male.

**ABDOMEN:** Wider, strongly greenish or brassy black, and rather flattened at the end of the second segment and on the third segment; the pile is much shorter and is entirely pale shining yellow except for large patches of flat-lying black pile in the middle of the second and third segments and a smaller similar triangle in the middle of the fourth segment. None of these triangles quite extends to the base of the segments. Posteriorly the remainder of the pile on the third and fourth and fifth segments is, including that upon the posterior part of the lateral margin, appressed and pale. This leaves the pile in the anterior corner in the form of large triangles, erect as well as pale.

#### DISTRIBUTION

British Columbia, Cranbrook, one male (holotype), May 8, 1920, C. B. D. Garrett (C.N.C.).

**MATERIAL STUDIED:** One male and two females, Cranbrook, British Columbia.

**RECORDS BY OTHERS:** None.

Shortly after describing this species, its author, Curran, concluded that his species was identical with *robusta* Hine. Having studied paratypes of *robusta* and what we believe is material of *columbiae*, we feel that both species are distinct.

#### *Cheilosia luna*, new species

Figures 47, 74, 121

Very small polished species with erect, mostly black pile on the mesonotum; the abdominal pile almost wholly erect; the scutellum with black bristles on the edge; facial tubercle small but prominent; antennae brown, slightly orange below. Related perhaps to *borealis*. Length 5 mm.

#### FEMALE

**HEAD:** Front shining black with a faint, medial, impressed line and a suggestion of a transverse shallow excavation across the lower part. Pile of the front about half pale yellow with longer, slender, black bristles that become still longer across the upper portion of the occiput; on the posterior occiput the pile is yellow. Upper ocular pile almost black, the lower part pale yellow. Face shining brownish black, decidedly pubescent, the tubercle small, the face moderately excavated above it. The antennae are brown, the upper part of the third segment dark, the basal ventral third somewhat reddish, the shape orbicular with several minute punctures on the inner surface. The arista is black, basally thickened.

**THORAX:** Mesonotum shining black with a faintly greenish cast, the pile erect, about half of it light brownish yellow, the remainder of longer, slender black bristles. Pile of scutellum similar, the margin with a pair of long, slender, apical bristles, a pair of subapical ones, and four or five shorter ones anterior to these.

**LEGS:** Shining brown; the narrow apices of the femora, most extensively on the middle pair, at least the basal third of all the tibiae,

and the narrow apices of the tibiae light yellowish brown. Hind tarsi quite dark brown, the hind basitarsi somewhat thickened, their dorsal pile blackish. The fore and middle tarsi are light brown, the middle basitarsi light yellow.

**WINGS:** Nearly hyaline, pale brown, the stigma pale yellow. The subapical cross vein is confluent with the third vein, remote from apex and only slightly curved. The initial section has a well-developed spur, and this section is rather long.

**ABDOMEN:** Broad, considerably wider than the thorax at the end of the second segment, polished brassy black, the pile erect, rather sparse, pale brassy or brownish yellow, the posterior part of the middle of the second and third segment with some appressed pile which appears to be wholly pale.

#### TYPE

Holotype, female, California, Santa Cruz, March 11 (A.M.N.H.).

#### *Cheilosia angelica* Telford

Figures 4, 48, 73, 119

*Cheilosia angelica* TELFORD, 1939, Minnesota Tech. Bull., no. 140, p. 35.

A shining black species which has a small but well-rounded tubercle, medium-sized, yellowish orange antennae, and mostly whitish pile except for a few black hairs near the ocelli, above the wing base, and on the discs of the second, third, and fourth segments. Scutellum has about three pairs of black bristles which are more than twice as long as the fine white pile on discs of the scutellum. There is a pre-apical depression on the scutellum. This species is very closely related to *dakota*. The hind basitarsal pile of *angelica* is black, however, and the female has a more narrow face. Both species have a cupreous coat to the mesonotum; the mesonotal pile of *dakota* seems longer, and in this species there is no trace of spur veins from the base of the subapical cross vein; such spurs are well developed in *angelica*. Length 8 mm.

#### FEMALE

**HEAD:** Eyes sparsely silvery pilose, the pile of moderate thickness. Front silvery pilose with five or six very fine black hairs on the lower part of the front and a few additional

hairs on the upper part of the front. Frontal pile quite sparse. There is a group of slender, long black hairs between the ocelli with similar silvery pile behind. Face polished shining black with a sparse thin pubescence widely distributed; the cheeks and the quite prominent rounded tubercle and epistoma just below it bare. Facial strips rather narrow, pubescent, with but a single row of long silvery pile. Antennae brown, the greater ventral part of the third segment orange. Arista dark brown, a little thickened, first two segments shining. Arista relatively short.

**THORAX:** Mesonotum highly polished, shining black, with faint suggestions of three bronze vittae, the pile erect but short and chiefly silvery. There are four or five black hairs on the notopleural region, a single large black bristle, and one small one. All pleural pile pale yellowish white except one very long black bristle on the upper part of the mesopleura. Immediately above the wing are two large black bristles and about seven small ones. There are two large, quite long black bristles on the postcalli in addition to some smaller ones and the silvery hairs. Just before the scutellum are seven or eight fine long black hairs. Scutellum shining black, perhaps with a faint bluish tinge, its pile sparse but erect, silvery, and on the margin are four pairs of rather long, quite slender, tuberculate bristles. Ventral fringe of scutellum unusually abundant, quite long and silvery. Some of its hairs longer than those on the disc.

**LEGS:** Femora shining black; narrowly brownish apically, most extensively along the anterior apical end of the middle femora. The pile of hind femora almost wholly pale yellowish white, the black hairs confined to the middle and subapical region on the ventral side; the lateral and dorsal pile pale even to apex, quite abundant with a well-developed guard bristle row sticking out at right angles; its length not more than the thickness of the femora from the dorsal aspect. Tibiae yellowish brown on the basal two-fifths of hind tibiae. Almost the half of the middle tibiae and about two-fifths of the anterior tibiae, and somewhat more than a fifth and less than a third of the apex of fore and mid tibiae similarly colored. Apex of hind tibiae narrowly darker brown. Basal two segments of ante-

rior tarsi and middle tarsi light yellowish brown, their pile wholly yellow above. Hind basitarsi and remaining segments black and black pilose above.

WINGS: Uniformly light brown, slightly darker near the middle, exclusive of the costal cell and the base of the marginal cell which are definitely paler. Stigma yellow; subapical cross vein slightly but regularly sinuous, joining third vein rectangularly to its curvature. Both lower cross veins with spurs.

ABDOMEN: As broad as thorax in the middle; the pile on the first segment, basal half of second segment, and lateral thirds approximately of third and fourth segments, and almost all on fifth segment silvery white. In the central posterior part of the second, third, and fourth segments the pile is completely flat appressed, black, and setaceous. On the second, third, and fourth segments the black pile occupies roughly triangular areas, and the white pile, which tends to occupy the anterior corners all the way to the posterior angles where it margins the black pile, is itself appressed and gives the impression of flat bands of pale-colored pile in some lights. The pile in the anterior corners remains quite erect; these areas large on the second segment, somewhat smaller on the third segment, and least on the fourth segment.

#### DISTRIBUTION

Type, Minnesota, Grand Rapids, five females (U.M.).

MATERIAL REVIEWED: Paratypes, and Michigan, Bay County, one female, June; Cheboygan County, one female, June.

RECORDS BY OTHERS: None:

#### *Cheilosia nigrescens*, new species

Figure 23

A shining black species with black and yellow erect pile; antennae quite dark, the third segment of the female small and round; black bristles on the rim of the scutellum. This species is related to *obesa*, in which the pile is mostly black, the antennae longer, the front much wider, the species more robust.

#### FEMALE

HEAD: Shining black, the face slightly produced below and with a small rounded tuber-

cle; lightly pubescent and more heavily below the antennae. Pile of the strips, cheeks, and lower occiput all yellowish. Front rather heavily punctate with a very shallow median sulcus, the pile all black immediately above near the ocelli, mixed black and yellow across the middle; sides of the front nearly parallel. Antennae dark brown to black, the third segment somewhat lighter in color, the arista dark brown with very short pubescence. Pile of the eyes white on the lower half, dark brown to black on the upper half.

THORAX: Shining black, mesonotum with erect black and yellow pile mixed; pile of the pleura yellowish with black hairs on the upper edges of the mesopleura and pteropleura. Pile of the scutellum black and yellow mixed with numerous black bristles along the edge; the fringe yellow.

LEGS: Reddish brown to black, yellowish at the extreme tips of the femora and at the basal thirds and tips of the tibiae; four front metatarsi somewhat reddish yellow. Pile of the legs mostly black with the usual pale hairs mixed on the femora and the under sides of the front and hind tarsi.

WINGS: Tinged with brownish, the stigma yellowish. Squamae and plumule almost whitish, the fringe yellowish; halteres yellowish.

ABDOMEN: Shining black with erect yellowish pile, a few black hairs on the anterior corners of the first and second segments; black pile entirely absent in some specimens.

#### TYPES

Holotype, female, Oregon, Talent, March 8, 1930, L. G. Gentner; and three paratype females, one, April 5, from Talent, two, April 25, from Corvallis, 1930 (holotype, A.M.N.H.; a paratype, Hull coll.).

#### *Cheilosia pikei* Shannon

*Chilosia aldrichi pikei* SHANNON, 1922, Insecutor Inscitiae Menstruus, vol. 10, p. 130 (in key only).

Intermediate between *bigelowi* and *decumbens*. The front of the male has white and black pile intermixed, and the pile of the mesonotum is also intermixed with white and black pile. The coxal spur is extremely sharp and pointed backwards, much more so than in the related species. Length 8 to 10 mm.

## MALE

**HEAD:** Pile of eyes and upper occiput and of front white. There are a few, long, slender, black hairs between the ocelli and sometimes four or five black hairs among the more numerous silvery ones of the front, or the pile of the front may be wholly silvery. The front is shining black with very sparse, almost unnoticeable, silvery pubescence. There may be a shallow, medial groove which expands into a slight sunken space in the middle. The front is granulate. The antennae are rather small, the first segment and the base of the second blackish; third segment light orange brown, the apical margin sometimes blackish. Arista basally thickened, short, and microscopically pubescent. The face is shining black with sparse whitish pubescence and no pile. The facial strips are both pilose and pubescent. The tubercle of the face is rather prominent, varying to some extent, and where it is most abrupt above and most prominent the face is more deeply concave above, and these specimens seem to have the face more extensively pubescent.

**THORAX:** Mesonotum shining black, with perhaps a very faint greenish cast; the pile of the mesonotum is quite thick and erect and fairly long and yellowish white. There may be almost no black hairs mixed in with this or black hairs may be rather numerous on the whole of the mesonotum and scutellum and particularly thick on the notopleura. However, the pile of the lateral pleura is entirely pale whitish. Scutellar pile long, erect, and whitish, with very slender, long, delicate black hairs along the margins. The ventral pile is especially long and bushy.

**LEGS:** Femora shining black, the apices narrowly light brown, the pile whitish along the sides, black near the apex and short and yellow on the ventral two-thirds. There are numerous ventral, stiff, black hairs on the outer portion. The tibiae are all yellowish brown, blackish centrally on both sides in the middle, and on the hind pair only the narrow apices are yellowish. The pile of the hind tibia is wholly yellowish except that there are two or three black hairs dorsally near the apex. All of the tarsi are blackish brown, the hind tarsi nearly black, their basitarsi black pilose. Fore coxae angulate and spurred.

**WINGS:** Nearly hyaline, the stigma pale brown, the subapical cross vein joining the pre-apical section of the third vein at a right angle. Both lower cross veins are spurred at base.

**ABDOMEN:** Narrowly oval, shining black and faintly greenish and obscurely subopaque on the extensive, flattened, central area of the second and third segments. The abundant yellowish white pile is chiefly erect, becoming appressed centrally on the second and third segments and black and appressed on a large posterior triangle on the third segment and appressed and whitish centrally on the fourth segment where there are a few black hairs intermixed. On the base of the fourth segment, however, the erect pile reaches almost to the middle. The hypopygium is prominent, shining black and gray pubescent, with only long white pile.

## FEMALE

**HEAD:** Front shining black, granulate, slightly swollen through the middle; the pile of the front and eyes and occiput and of the vertex except for one or two hairs is silvery white. The antennae are not much larger than in the male and are similarly colored. The facial tubercle is at least as prominent, perhaps a little more so, and the face is largely bare of pubescence.

**THORAX:** Shining yellowish white pile throughout on the mesonotum, scutellum, and pleura, all of which is quite flat appressed. On the middle of the mesonotum there are a very few fine, appressed, black hairs which in some specimens are almost wholly lacking. There are only one or two fine black hairs on the notopleura or over the base of the wing. On the margin of the scutellum there are two or three pairs of longer, very slender pale hairs that vary in length.

**LEGS AND WINGS:** Similar to those of the male.

**ABDOMEN:** Shining greenish black, the pile exceedingly short and flat-appressed except for small patches of erect pile in the anterior corners of the third and fourth segments and on the whole lateral margin of the first two segments. The flat pile posteriorly in the center of the second, third, and fourth segments is extensively black.

## DISTRIBUTION

Type, Colorado, Tennessee Pass, July 10, 10,240 feet, J. M. Aldrich coll.

MATERIAL REVIEWED: Type, and Colorado, Westcliffe, Sargent, Pingree, Creede, Talland, Cameron Pass, Lake City, Alton Canyon, Peaceful Valley, Slumgullion Pass, June-August 21; Utah, Glacier Lake.

RECORDED BY OTHERS: None.

*Cheilosia bigelowi* Curran

*Chilosia bigelowi* CURRAN, 1926, Canadian Ent., vol. 58, p. 212.

Characterized by the thick, long, black pile of the front, the vertex, and the upper occiput in which there are only a few white hairs, the long mixed black and white pile of the mesonotum, scutellum, and upper pleura, and the more extensively pubescent face. There is also some black pile on the sternites. Related to *pikoi*. Length 9 mm.

## MALE

HEAD: Occiput with long black pile and short white hairs, the vertex almost wholly with very long black pile, in which are two or three short white hairs. The front is similarly long, black, erect pilose, the pile arranged in two diagonal strips, leaving a bare V-shaped area in front, and mixed with the black pile are a very few short white hairs. The front is shining black, granulate, without pubescence, except very narrowly along the eyes, and with a linear, medial groove on the lower two-thirds; the eyes touch for a considerable distance, the upper facets very little enlarged; the eyes are a little bulging at the line of junction. The first two segments of the antennae are very dark brown; the third is reddish brown, the apical margin smoky. The arista is dark brown, short, strongly thickened basally, and micropubescent. The face has a small but prominent tubercle, not quite so abrupt above as below; the upper concavity is shallow but deep below the tubercle, and the face is rather extensively pubescent on all except the tubercle and immediately below it. Facial strips are pubescent laterally and white pilose. The ocular pile is sparse and white.

THORAX: Mesonotum and scutellum shining black with a slight greenish luster, the thick, fine pile is erect and long and almost

equally white and black. There are some black hairs on the upper part of the mesopleura, and they are numerous on both the disc and the margin of the scutellum, the latter longer and constituting very slender bristles. Squamae white with pale yellow border and fringe. The halteres have dark brown knobs.

LEGS: Femora black, the apices narrowly dark brown, the pile of the hind femora long, thick, and yellowish white, except laterally near the apex, and with short black hairs ventrally which are confined to the outer two-thirds. The anterior femora have five or six long black hairs laterally near the apex, and there are a few apical black hairs on the middle femora. The tibiae are brown, the hind tibiae darker, the middle of all the tibiae widely blackish. The hind tibiae are almost entirely sparse, flat appressed, yellowish white pilose with blackish pile ventrally on the basal half and a little black pile basolaterally and dorsally. The middle tibiae are extensively black pilose throughout the whole ventral surface and have some black hairs in the middle dorsally. The first segments of the middle and anterior tarsi are dark brown; all the remaining segments of the tarsi are blackish; all segments are black pilose above. Fore coxae angulate.

WINGS: Rather elongate and pale brown; the stigmal cell yellow; the third vein quite straight; the distal section of the first posterior cell rather long, its basal section with a short spur; the last section of the fourth vein is long, the subapical cross vein forms a right angle with the third vein, and the postical cross vein is quite straight and spurred.

ABDOMEN: Oval, the second segment subopaque black except quite narrowly on its posterior margin and more widely on the sides. The third segment is more shining and the fourth segment entirely shining black. The pile of the middle of the second segment and widely through the middle of the apex of the third segment is subappressed and black. The pile of the fourth segment is more sparse, but there are some nearly erect black hairs basally and abundant, almost flat lying, black pile posteriorly in the middle of the segment. All the remaining pile of the abdomen is erect and rather long and white. The pile of the second sternite is quite long, erect, and pale;

of the third and fourth sternites rather short, appressed, and widely black in the middle.

#### DISTRIBUTION

Ontario, Low Bush and Long Point, Lake Abitibi, June 10, 1925, two males, Bigelow (C.N.C.).

MATERIAL REVIEWED: Washington, Mt. Rainier, Sunrise, 6380 feet, August 14, 1932, one male, J. Wilcox; California, Plunge Creek, March 5, one male, C. H. Martin; Alaska, Matamuska, 1945, one male, six females.

#### *Cheilosia bigelowi callichroma*, new subspecies

The Californian specimen differs slightly from the Washington one. The wings are uniformly but considerably more brownish, the stigmal cell is brown instead of light yellow, the subapical cross vein is sigmoid due to a curve upon the basal half, and the third longitudinal vein is strongly curved in contrast to the straight one of the Washington specimen. The third antennal segment is blackish on the apical half, and the medial crease of the front extends nearly to the apex above. The ventral sternites lack the black pile, and black pile seems to be absent from the fourth tergite.

#### *Cheilosia decumbens*, new species

Distinguished from *bigelowi* Curran, to which it is closely related, by the white frontal pile, white mesonotal, scutellar, and sternal pile, and less extensively pubescent face in the male. Length 10 mm.

#### MALE

HEAD: Eyes sparsely white pilose. The face and front are shining black, the former bare except for the narrow linear zone of pubescence close to the facial strips, which are pubescent and white pilose; the front is granulate, with a deep medial impression; the pile is largely denuded, but with at least some long pale yellow hairs and some shorter black ones. The vertex is pale, whitish pilose with two black hairs; the facial tubercle is prominent, the face is considerably excavated above. The antennae are brown, the third segment is light orange, blackish at the apex. The arista is dark brown, basally thickened, micropubescent.

THORAX: Mesonotum shining black with erect, light yellow pile throughout. The mesonotum, pleura, and scutellum have a single black hair above the wing base and eight or 10 on the notopleura. The scutellar marginal pile is pale, delicate, and but little longer than the long distal pile. The squamae are pale yellow, the halteres blackish knobbed.

LEGS: Shining black; the apex of the middle and anterior femora, the very narrow base of the hind tibiae, and the basal two-fifths and narrow apex of the middle and anterior tibiae are dark brown. The tarsi are black, the basitarsal pile is black above. The hind tibiae are chiefly pale golden pilose including the outer lateral surface on which there are only 10 or 12 black hairs, but on which there is some short, black, ventral pile; hind femora extensively short, golden pilose ventrally, black on the outer third, with some longer and abundant, golden pile on the sides, and on the outer surface black pile on the apical third.

WINGS: Pale brown, barely darker in the middle; the stigma is yellow.

ABDOMEN: Oval shining black, with thick, moderately long, erect, light yellow pile everywhere except on posterior middle triangular areas of the second and third segments which are flat-appressed, black pilose. This black appressed pile extends narrowly down the middle of the fourth segment.

#### FEMALE

HEAD: Eyes sparsely white pilose, the face shining black, the tubercle well developed. The face is well excavated above, the lower sides are narrowly pubescent above and across to the epistoma. The vertical pile is black with some whitish hairs intermixed; the front is white pilose in which are numerous black hairs intermixed, its surface and its differentiated sides are punctate. The antennae are brown, with the third segment orange, slightly flattened dorsally and apically and blackish on apical and dorsal margin. The arista is short, thick on the basal half, blackish, and micropubescent.

THORAX: Mesonotum thickly, flat lying, yellowish white pilose; the pleura are wholly appressed whitish pilose; the scutellar pile appressed, the margin with two pairs of slender, long, black hairs and several long pale



ones that are scarcely bristles. There are several black hairs above the wing; none on notopleura.

**LEGS:** Shining black, the apices of all of the femora narrowly, the basal two-fifths of all of the tibiae and their apices, light brownish yellow, the middles blackish; the pile of the hind tibiae wholly pale whitish yellow; that of middle tibiae similar except on the ventral surface where it is black from end to end. Hind tarsi and last three segments of front and middle tarsi black; the others dark brown. The basitarsal pile is black above. Hind femur slender, short yellow pilose ventrally with only a few slender black hairs on the apical third, its lateral and dorsal pile including the apex pale yellow. Fore coxae angulate.

**WINGS:** Pale brown; the stigma yellow.

**ABDOMEN:** Oval, wholly whitish pilose except on the extensive, triangular, middle posterior region of the second, third, fourth, and fifth segments which are flat, appressed, black pilose. All of the outlying, lateral, pale pile is flat-lying except for marginal bands of erect pile in the anterior corners.

#### TYPES

Holotype, male, Idaho, Mt. Moscow, July 10, 1930, J. M. Aldrich (U.S.N.M.); allotype, female, Colorado, Tennessee Pass, August 17, 1930, 10,240 feet, J. M. Aldrich (U.S.N.M.); paratypes, one male, Idaho, July 10; one female, Colorado, August 17, both collected by J. M. Aldrich.

#### *Cheilosia aldrichi* Hunter

*Chilosia aldrichi* HUNTER, 1896, Canadian Ent., vol. 28, p. 229.

We do not believe that we have seen this species. Hunter describes the legs as unqualifiedly black. Shannon included it in the group with angulate fore coxae. It is not clear whether he had seen the type. Described only from the female, the eyes were said to be bare. The original description is as follows:

"Eyes bare, arista scarcely pubescent, scutellum without bristles, legs black.

"Female. Shining black, almost bare. Front trisulcate, coarsely punctate, yellow pilose. Face shining on middle portion, powdered on the sides, between the lateral sutures and the eyes short pilose, below the antennae deeply concave, below the tubercle

slightly so. Tubercle round, projecting as far as the apex of the third antennal joint. Cheeks shining black, white pilose. Occiput shining olivaceous, light pilose. Ocellar area with a few black hairs. Antennal joints one and two black, third flattened, oval, slightly longer than broad, reddish-brown, darker above. Arista basal, almost bare, black, somewhat incrassate at base. Dorsum shining black, lightly punctate, very sparsely short yellow pilose, humeri dark. Pleura shining, pilose like the dorsum. Scutellum black, shining, more strongly punctate than the dorsum. Abdomen oval, widest at the apex of the second segment, everywhere shining black; black pubescent in the middle, and short white pilose at the sides anteriorly. Legs black; front pairs, including the coxae on the under side and posterior tarsi at apex, very indistinctly golden pubescent. Wings subhyaline, indistinctly tinged on the basal half with brownish, long, rather slender, veins brown. Apical cross-vein without stump, except at the base. Tegulae white. Length, 9 mm. Al., 8 mm. The colour of the third antennal joint in this species varies from very dark reddish to almost black."

#### DISTRIBUTION

Idaho, Craigs Mountain, three females, J. M. Aldrich. Location of types uncertain or types lost.

#### *Cheilosia chrysoclamys* Williston

##### Figure 35

*Chilosia chrysoclamys* WILLISTON, 1891, *Bio-logia Centrali-Americana*, vol. 3, p. 8.

Characterized by the light orange antennae, the deeply concave, thickly pubescent face, and the thick, reddish golden pile of thorax and abdomen, which is quite flat appressed on the posterior part of the abdomen. Wings strongly tinged with brownish yellow. This species belongs to the *dakota* group. Length 9.5 mm.

#### FEMALE

**HEAD:** Eyes thickly, long, yellowish white pilose; pile of occiput, front, and vertex thick, erect, and reddish golden. The front is granulate, brassy in reflection, rather flattened but on the upper half gradually and very slightly raised on the middle two-thirds. Antennae

orange red with a faint suggestion of brown along the apical margin of the third segment. The arista is blackened, microscopically pubescent, slightly thickened basally. The face has a prominent tubercle and is unusually deeply concave beneath the antennae; entire face whitish pubescent, the strips with both pile and pubescence.

**THORAX:** Bright brassy brown, almost coppery on the posterior half of the scutellum, the pile everywhere thick, erect, and reddish golden. The margin of the scutellum has numerous longer hairs of the same color. There are a tuft of black hair immediately above the wing and a single one on the notopleura; pleural pile yellowish white.

**LEGS:** Femora black with narrow orange brown apices; tibiae orange brown, black centrally and narrowly on the lateral surface of the first tibiae, both sides of middle and hind tibiae, pile of hind tibiae entirely pale yellow except that it is golden apically on the medial side. Pile of hind femora whitish with eight or nine slender black bristles ventrally near the apex. Tarsi reddish brown, the last three segments and the whole of the hind tarsi except their ventral surfaces brownish black. Pile of hind basitarsi chiefly reddish or golden brown but with a few black hairs narrowly down the middle of the dorsal surface.

**WINGS:** Strongly tinged with yellowish brown over the region of the central cross veins and the ends of the basal cell. Stigmal cell deep yellow, subapical cross vein without a spur at base, joining the last section of the third longitudinal vein at right angle.

**ABDOMEN:** Rather flattened, shining brassy, almost coppery on the sides, the first segment, however, greenish black. The pile in the anterior corners of the third and fourth segments and over the whole lateral margin of the second is erect and golden, the remainder of the pile is quite flat lying, thick and abundant, projecting well beyond the posterior margin of their segments, and rich golden yellow.

The male is very much like the female; the front is thinly pubescent, its pile yellow.

#### DISTRIBUTION

Type, Mexico, Guerrero, five males and females (B.M.N.H.); paratype (Hull coll.)

**MATERIAL REVIEWED:** Types.

**RECORDED BY OTHERS:** Recorded without locality by C. R. Jones in 1922 from Colorado; the authors take the view that this record probably represents some other species. This conclusion is based upon the large number of species existing and the difficulty of accurate determinations.

#### *Cheilosia catalina* Shannon

Figures 34, 52, 105

*Chilosia catalina* SHANNON, 1922, *Insecutor Inscitiae* Menstruus, vol. 10, p. 137.

Characterized by the short, sparse pile, the wholly bright, light orange antennae with their basally yellowish, strongly pubescent arista and the general bluish black coloration. The mesonotum is only moderately shining and is gray vittate. The species is related to *burkei* but has no pile on the face. Apical angle of first posterior cell strongly acute. Length 8.5 mm.

#### FEMALE

**HEAD:** Pile of front sparse, erect, bristly, and black, with similar pile about the ocelli. The postoccipital pile behind the ocelli is pale yellow. The ground color of the front is shining bluish black with faint medial impressed lines but no groove. The front is transversely and shallowly excavated on the lower third, and this area is whitish pollinose merging in with white pubescence along the eye margins. This ocular pubescence is widely interrupted opposite the antennae. The antennae are entirely light, bright orange; the third segment is oval, a little longer than wide, evenly rounded apically and without pores on the medial surface. The arista is yellowish at the base, thickened on the basal fourth, brown outwardly and pubescent almost to the tip. The face is shining bluish black with well-developed tubercle which is equally abrupt above and below. The face is without pile and with only scant white pubescence. The facial strips are white pubescent and white pilose, expanding into a triangle of thick whitish pubescence below the antennae and along the eye margins. These triangles are connected by sparse pubescence below the antennae. The ocular pile is sparse and white.

**THORAX:** Moderately shining bluish black; on the mesonotum the pile is short, fairly sparse, subappressed, and chiefly light shin-

ing yellow in which there is a considerable quantity of black pile, especially on the posterior part of the mesonotum. However, the pile is largely yellow in front of the scutellum, in front of the calli, and entirely so on the postcalli except for two black bristles. There are only one or two black hairs in front of the transverse suture. The pleural pile is wholly light yellow. The scutellar pile is almost entirely light yellow and subappressed, with a single pair of long slender black bristles and laterally a shorter pair of yellow ones.

**LEGS:** Femora brownish black, their extreme base and a little more of their apices yellowish brown. All the femora in an oblique light are yellowish micropubescent and with short, yellowish pile on the sides and ventrally; also laterally there are a few slender black hairs near the apex and three or four longer ones dorsolaterally on the outer third. Ventrally on the outer half there are six or seven very slender black setae, which are scarcely noticeable, and several still more delicate ones near the apex below. The tibiae are chiefly yellowish brown but are obscurely darker brown in the middle; this dark area is perhaps a little more extensive on the hind tibiae but is everywhere diffuse. The pile of the hind tibiae is short, appressed, delicate, and chiefly blackish. It is reddish golden ventroapically and along the entire medial surface on the distal half; on the middle tibiae it is almost wholly blackish; on the anterior tibiae reddish on the whole medial surface. The tarsi are medium brown, the hind tarsi a little darker, their pile everywhere black above.

**WINGS:** Elongate, strongly tinged with brownish yellow, the base particularly yellowish. The subapical cross vein has a slight proximal bend, the remainder straight, paralleling the wing margin to join the third vein at quite an acute angle. Third vein slightly curved, the apical section of the first posterior cell quite long, the stigmal cell yellowish.

**ABDOMEN:** Short oval, more shining than the thorax, and greenish black. The pile is quite scant but is erect everywhere except on a small area in the middle of the third and fourth segments and the apex of the middle of the second segment where it is appressed. Otherwise, the pile is short and erect and all of the pile is yellowish white except for per-

haps three or four black hairs in the middle of the third segment.

#### DISTRIBUTION

Arizona, Webber's Cabin, 7500-8500 feet, Santa Catalina Mountains, July 27, 1917, one female (C.U.).

**MATERIAL REVIEWED:** The type.

**RECORDS BY OTHERS:** None.

#### *Cheilosia sororia* Williston

##### Figure 24

*Chilosia sororia* WILLISTON, 1891, *Biologia Centrali-Americana*, vol. 3, p. 8.

Although we have examined and illustrated the type of this species and have redescribed it, it is not included in the key, as the key was constructed after access to the type was no longer possible.

Characterized by the brassy black color, bright antennae, projecting tubercle, and appressed abdominal pile. Belongs to the *bigelowi* group. Length 8 to 9 mm.

#### FEMALE

**HEAD:** Round, slightly ellipsoidal in front. Front broad, quite punctate, brassy black, raised in the middle as a broad wide band, yellowish pubescent and yellowish pilose. The ocelli are not particularly prominent, but their small tubercle is marginate. The postociput at the vertex is quite thick. The facial tubercle is large, evenly rounded, conspicuous, smooth, shining, and bare. The face and cheeks are black, without pile, the facial strips dark mahogany. The sides of the face are narrowly pubescent close to eyes, sparsely scattered pubescent elsewhere but more widely on the extreme lower face. The antennae bright reddish orange and silvery pubescent; the first and second segments are darker. The arista is black and swollen basally and short pubescent; the eyes are short but widely pilose. The facial and occipital pile is white, but at the front and vertex pale yellow.

**THORAX:** Mesonotum and pleura brassy black, the scutellum black, both shining and both heavily punctate. There is a depression before the rim of the scutellum; its pile is short but pale; there is a strong, posteriorly directed fringe of yellowish hair ventrally. The pleural pile is all white; the pile of thorax subappressed and yellow.

**WINGS:** Pale brownish, the stigma is honey

yellow; the spurious vein is a mere fold. The plumulae and squamae are snow white, the latter lemon bordered, the fringe white; the halteres are yellow, orange tipped.

**LEGS:** Femora shining black, the tips reddish, their pile whitish. The tarsi and tibiae are light brownish red. The last two fore tarsal segments are darker, as well as the last two hind tarsi. The mid-tibiae are black clawed and the tarsi are black spinose. The remainder of the pile of the legs is pale.

**ABDOMEN:** Black, slightly brassy, very punctate, the pile very much appressed. The corners of the segments and the posterior margins are narrowly banded with pile that is golden in the middle and white on the edges. The sides of the abdomen are considerably curved downwards.

#### DISTRIBUTION

Mexico, Ciudad in Durango, two females, 8100 feet (types, B.M.N.H.).

**MATERIAL REVIEWED:** The types, from which our description is taken.

**RECORDS BY OTHERS:** None.

Williston, in his description, said that the facial tubercle extends beyond the base of the antennae; he called the wings grayish or yellowish hyaline. Hunter considered *punctulata* to be closely related.

#### *Cheilosia subchalybea* Curran

Figures 21, 63, 76

*Chilosia subchalybea* CURRAN, 1923, Canadian Ent., vol. 55, p. 276.

A shining blue black fly with wide protuberant front, pale orange antennae, and strongly pubescent arista. The mesonotum has a pair of narrowly separated gray vittae. Related to *catalina* Shannon. The tibiae are more extensively black and the mesonotal pile is uniformly black. Length 7 mm.

#### FEMALE

**HEAD:** Front shining bluish black, protuberant in profile with slender, medial, linear groove and wide, shallow, transverse excavation on the lower third. The pile of the front and vertex is everywhere erect or nearly erect and black but rather sparse and without granulation. The frontal lunule is yellowish brown. The first two segments of the antennae are light brown; third short oval and entirely light orange except very narrowly at

the base of the arista. The long pubescent arista is brownish black. The face is shining black, chiefly bare and without pile. There is a little pubescence on the cheeks and there is also a spot of thick pubescence, above which is the widened, upper portion of the facial strips. The entire facial strips are pubescent and short yellowish white pilose. Pile of eyes short, sparse, covering the entire eye, and light yellow.

**THORAX:** Mesonotum and scutellum shining bluish black, the short thick black pile erect. Pile of mesopleura whitish with eight or nine black hairs above. Pteropleural pile black above. Scutellar pile short, black on the disc with two or three pale hairs and on the margin with two pairs of moderately long, slender, black bristles and two or three shorter ones on each side nearer the base.

**LEGS:** Black, only the extreme apices of the femora brown. The tibiae are blackish with the basal third of the anterior pair, basal half of the middle tibiae, and the basal sixth of the hind tibiae, dull brown. All the tarsi are black and black pilose. The hind femora are black pilose, with some white pile on the basal half laterally, dorsally, and ventrally. The pile on the basal half is very delicate and but little longer than the remaining pile. The femora and the tibiae are strongly, microscopically, yellowish pubescent. The hind tibial pile is almost entirely black except for a little reddish pile ventrally and medially near the apex.

**WINGS:** Elongate, brownish hyaline, the stigmal cell yellow, the distal section of the first posterior cell quite long and the subapical cross vein forming about an 80-degree angle with the pre-apical section of the third vein.

**ABDOMEN:** Short and widely oval and shining bluish black. The pile is short and yellowish white and erect except in the middle of the second and third segments where there is some quite sparse, short, suberect, black pile. Pile of the fourth segment entirely erect and with only a very few black hairs in the middle; a few of the middle hairs appear reddish. All of the pile of the abdomen is rather sparse.

#### DISTRIBUTION

British Columbia, Cranbrook, one female (holotype), May 16, one female (paratype), May 17, 1922, C. B. D. Garrett (C.N.C.).

**MATERIAL STUDIED:** The paratype, and one additional female with same data; one female, Woburn, Quebec, C. H. Curran.

**RECORDS BY OTHERS:** None.

***Cheilosia nigrobarba*, new species**

Figures 5, 110

Shining black flies with wide face and very wide facial strips; tubercle small and low. Front and vertex and eyes with long, whitish pile. Antennae clear brownish orange. Related to *bicolorata* (female), but the fore and hind tibiae are extensively black pilose in the middle, the whole pile is lighter, and the facial tubercle is smaller. The face is shorter than in *bicolorata*. Length 10.5 mm.

**FEMALE**

**HEAD:** Densely long, whitish pilose; front broad, considerably narrower towards the ocelli, flattened and with large semicircular pitted areas on either side of the eye; the frontal and vertical pile wholly whitish. The face is short, a little produced downward, highly polished and shining black, the tubercle small, narrow, low, and obtuse. The face is polished, largely bare on either side of the tubercle, with a little pubescence below it and a patch of quite long, erect pubescence lying between the lowest point of the epistoma. Facial strips extremely and unusually broad, dark mahogany, bare and shining, broadly long, pale yellow pilose. Antennae close together but separated, of moderate size; all three segments are of about the same color, the outer two a little lighter; the third segment is light brownish orange, orbicular, shining, and glossy. It has probably gotten greasy. Arista short, strongly and evenly thickened on the basal half, two basal segments showing.

**THORAX:** Mesonotum shining black with a greenish brassy cast, the pile very dense, fairly long, quite erect, and wholly pale yellow on mesonotum, pleura, and scutellum. Scutellum concolorous, the pile erect, the abundant pale marginal pile but little longer.

**LEGS:** Femora black, the apices narrowly light brown; basal two-fifths of hind tibiae, half of middle, and virtually the half of the anterior tibiae light yellowish brown, their apices dark or light brown on an eighth or more. Hind tarsi almost black above, their

dorsal pile black. Middle tarsi yellowish brown on the first segment, becoming darker towards the outer joint, likewise black pilose. Anterior tarsi brownish black above, black pilose. Hind femora yellow pubescent on a large non-pilose area lying ventrally near the apex and extending for about one-third the length of the femora. The particular characteristic of this area is its bareness and its very close-set erect pubescence. There is also pubescence over most of the outer surface of the femora, the pile on the outer surface is entirely black on the apical half, and there is only a little pile on the basal half, either ventrally or laterally. The black pile laterally and ventrally extends to the base. The pile of hind tibiae is yellow on the inner surface on the posterior half but black elsewhere. There is some grayish pubescence on both surfaces.

**WINGS:** Broad and relatively short, uniformly light brown in color, a little darker and perhaps slightly grayish on the outer half from the origin of the third vein. Stigma yellow. The postical cross vein is nearly straight, has a short spur, and is almost parallel to the wing. The apical cross vein is without spur, has a slight double bend instead of being sinuous, and retreats markedly away from wing margin to join the third vein rectangularly to its last section and to join it remote from apex.

**ABDOMEN:** Robust; the end of the second segment wider than thorax, quite convex, the sides strongly curved downward and the apex curved downward to produce a bowl. Ground color shining black with less pronounced brassy cast. Pile of first and second segment and a narrow strip along the base of the outer third of the third segment erect, abundant, and light yellow. The remainder of the pile of the abdomen is everywhere quite erect, of moderate length, and is black.

**TYPE**

Holotype, female, Colorado. Ward, June 2-9, 1933, Rodeck (A.M.N.H.).

***Cheilosia cynoprosopa*, new species**

Figures 30, 104

Characterized by the pale yellow mesonotal and scutellar pile, the paratuberculate face, the black hind basitarsal pile, and longer and

straighter subapical cross vein. Related to *cineralis*. Length 9 mm.

#### MALE

**HEAD:** Eyes thickly, moderately long, brownish white pilose. The upper facets are only a little enlarged, but the eyes touch for some distance. The vertical pile, except for three black hairs, and the whole of the frontal pile and the occipital pile immediately behind the ocelli are entirely whitish. On either side of the ocelli on the occiput there are a few black hairs. The ground color of the front is shining black with pubescence only quite narrowly on the eye margins. The pilar granulations are arranged in transverse rows and there is a narrow, medial, linear groove. The antennae are entirely brownish black; the second segment is very dark red above, the third segment perhaps slightly longer than wide, a little longer ventrally and with white pubescence. The arista is black, its pubescence submicroscopic. The face is shining black, thinly covered with yellowish white pubescence, of which there is a more pronounced circle meeting below the tubercle; the tubercle is prominent, quite abrupt below, and the face descending vertically below the tubercle to the epistoma; above the tubercle slopes gradually down to the shallow concavity below the antennae. The facial strips are pubescent and white pilose; face without pile.

**THORAX:** Mesonotum and scutellum rather dully shining black; upon either side of the middle of the mesonotum there is a pair of bronze vittae which may be faintly discerned. The pile is entirely erect, rather long, thick, delicate, and wholly pale brownish yellow except for seven black short bristles over the wing and one or two upon the postcalli. There are none upon the notopleura, pleura, or scutellum. The scutellum is without differentiated bristles of any kind, its pile is a little longer than the mesonotum.

**LEGS:** Femora black, the apices quite narrowly brownish, the pile on the ventral and lateral basal halves of the hind femora is entirely light yellow with a row of seven short, slender guard bristles; laterally near the apex the pile is both black and yellow; it is entirely yellow dorsally, except for one or two yellow hairs, but ventro-apically there are numer-

ous slender black bristles. The pile of the anterior middle femora is entirely yellow. All of the tibiae are light brown, obscurely blackish in the middle, their pile entirely light yellow. The tarsi are dark brown on the first two segments of the first four legs and all the remaining segments of all the tarsi blackish; the pile of all the hind tarsi is black above, although quite narrowly black on the hind basitarsi. The pile of all other tarsi is yellowish.

**WINGS:** Strongly tinged with brown, especially in the middle and on the distal anterior half. The distal section of the first posterior cell is long, and its cross vein forms a right angle with the third vein. The stigmal cell is brownish.

**ABDOMEN:** Rather elongate and slenderly oval. It is broadly subopaque black on the second and third segments but more shining blue greenish black on the sides and the whole of the fourth segment. The pile of the abdomen is entirely erect except in the middle of the second and third segments where it is subappressed. There are a few black hairs at the apex of the second segment in the middle and a few down the middle of the third segment. But most of this central pile is brownish yellow, the remainder of the pile is entirely erect, rather thick and long and pale brownish yellow. Pile of the sternites wholly pale.

#### TYPE

Holotype, male, Wisconsin, Madison, May, 1942 (A.M.N.H.).

#### *Cheilosia bicolorata* Shannon

##### Figure 40

*Chilosia bicolorata* SHANNON, 1922, Insecutor Inscitiae Menstruus, vol. 10, p. 139.

Characterized by the very thick, long, erect, yellow pile of the brassy thorax which is without black hairs except for two or three over the wing. The front is brassy and all of the cephalic pile light shining yellow. The antennae are large, all the segments pale brownish orange, and the arista is brownish black. The face has a shallow concavity, low tubercle, and is everywhere thickly yellowish pubescent. The fourth and last half of third abdominal segments are erect black pilose. Distal section of first posterior cell quite short. Related to *nigroapicata*. Length 10 mm.



## FEMALE

HEAD: Front, vertex, occiput, and eyes with long, very thick, light yellow pile. Ground color of front brassy and shining, the middles granulate, the lunate areas thick punctate, the front without noticeable transverse excavations. Antennae with all the segments light brownish orange, the third segment broadly rounded, apparently a little deeper than long. The arista is strongly thickened just at the immediate base without apparent pubescence. The face is quite deep and thickly long yellow pubescent but without pile; the tubercle is low, the facial concavity long but shallow. The ground color of the face is brassy black. Facial strips dark red, bare except for long yellow pile.

THORAX: Mesonotum and scutellum brassy black with exceedingly thick, brassy, yellow, erect pile. There are a few slender black hairs above the wing but nowhere else on the thorax. The scutellar pile is barely longer than that of mesonotum without differentiated bristles.

LEGS: The femora are black, their apices light yellow, the hind femora have golden pile throughout ventrally, mixed with some short black hairs, which are more numerous ventrolaterally on the distal third. There is lateral black pile on the distal half and dorsally near the apex. All of the tibiae are light yellow at the base and almost as light at the apex with a wide, dark brown area in the middle. The pile of hind tibiae is almost wholly yellow, with two or three blackish hairs in the middle ventrally. The first four tibiae are yellow pilose. The anterior tarsi are brown, darker on the apical segments, and with fine black pile above; middle tarsi yellow on basal segment and black pilose, the other segments brown; hind tarsi black and black pilose above.

WINGS: Strongly tinged with light brown, the stigmal cell more yellowish, the distal section of the first posterior cell is quite short, its cross vein with a basal spur; the cross vein joining the third vein at right angles remote from the apex of the wing.

ABDOMEN: Broad apically across the fourth segment; the fifth segment is an equilateral triangle. The pile is everywhere erect and rather long except in the middle of the basal half of the third segment where it is either

denuded or subappressed. All the pile of the second segment and the basal half of the third light, golden yellow; of the apical half of the third and the whole of the fourth and fifth segments fine, erect, thick, rather long and black. The ground color of the abdomen is shining black, but slightly brassy on the sides of the first and the base of the second segment.

## DISTRIBUTION

Idaho, Moore's Lake, July 10, 1907, one female, J. M. Aldrich coll. (U.S.N.M.).

MATERIAL REVIEWED: Type, and Alberta, Wubinun, May 11, 1924, one female, E. H. Strickland coll.

RECORDS BY OTHERS: None.

*Cheilosia pluto*, new species

Figures 11, 85, 109

This species is closely related to *bicolorata* Shannon, but there is such a marked contrast in the thick, yellowish pubescent face of *bicolorata* and the almost totally bare and polished face of the other that we are inclined to view them as distinct.

## FEMALE

Length 10.5 mm.

HEAD: All cephalic pile abundant, erect, and golden; no pile upon face, the ocular pile paler. Front shining black in ground color with slight brassy cast, thickly granulate in the middle and thick punctate on either side. Antennae orange, the third segment thick punctate; arista brownish black. The face is moderately deep, polished black, almost without pubescence but with barely a trace beneath the antennae. Facial tubercle low, the facial concavity shallow and gently sloping to the tubercle.

THORAX: All pile thick, erect, long, and deep golden, the ground color on mesonotum and scutellum bright greenish brassy. The marginal pile of the scutellum is rather long but without differentiated bristles.

LEGS: Femora black, their apices narrowly light brown. The tibiae are light brown, blackish in the middle, more extensively black on the hind tibiae where the apex is only narrowly and somewhat obscurely lighter brown. The hind femora are black pilose ventrally throughout and laterally on the apical half, dorsally on the apical fifth. There

are five or six long, basal, yellow bristles ventrally and a row of them laterally except towards the apex. The pile of the hind tibiae is entirely golden except for three or four hairs ventrally. All of the tarsi are blackish brown, all of the segments black pilose above.

**WINGS:** Strongly tinged with brown, particularly about the middle and distally. Last section of first posterior cell rather short.

**ABDOMEN:** Wider than thorax, short oval, the first and second segments entirely light yellow pilose; the pile is quite long on the sides but short centrally and on the first segment it is flattened and directed laterally. There are a few golden hairs laterally on the base of the third segment; pile of the remainder of abdomen erect, rather long, thick, black pilose. The ground color is shining black.

#### TYPE

Holotype, female, British Columbia, Salmon Run, May 13, 1933, Hugh Leech (A.M.N.H.).

#### *Cheilisia flavosericea*, new species

Figures 17, 68, 122

Characterized by the thick pubescence of the front and the copious long pale pile of the mesonotum. Related to *cineralis*. Length 7 mm.

#### MALE

**HEAD:** Front long yellowish white pilose, quite dense, the medial impression faint, the ground color totally obscured by pale yellowish white pubescence. The pile is distributed over almost the whole of the front; the vertical pile within the ocelli is long, fine, and black, behind the ocelli pale whitish yellow. Face dark, mahogany brown, only moderately shining and thickly long pubescent over the tubercle and most of cheeks; the lower epistoma is bare, the facial tubercle quite broad, low, inconspicuous, and gently concave above and below. Facial strips rather broader than usual, pubescent, uniformly white pilose. Antennae small, well separated, the first segment dark brown, the second and third light brown, the base of the third broadly reddish below. Third segment barely longer than wide, broadly rounded; the arista is brown, the basal third narrowly thickened, barely pubescent.

**THORAX:** Mesonotum shining black with very faint coppery tinge in the middle and with striking, very abundant, copious, pale yellowish white, erect, long, silky pile. On the notopleura on one side is a single fine black hair; there are three above the wing base, one on the upper mesopleura, none on pteropleura, postcalli, or scutellum. The scutellum is concolorous with the mesonotum, the discal pile is quite long and erect, the marginal non-bristly pile barely longer.

**LEGS:** Dark brown, all femora narrowly light brown at apex, the basal third of hind tibiae, two-fifths of fore and middle tibiae pale yellowish brown, their apices similarly colored. The basitarsi are dark brown posteriorly, light brown on the anterior pair above, and brownish yellow on the middle pair. All the basitarsi have at least some brown pile dorsally, though scant. Hind basitarsi with the entire inner dorsal half golden pilose extending around through the ventral half, leaving at most one-quarter with darker pile in which the golden pile is intermixed. Hind femora almost wholly pale brassy pilose, the pile rather long; ventrally on the apical two-fifths there are some 15 sharp fine black hairs and three or four others in the middle.

**WINGS:** Very pale brown, almost hyaline; the stigma is pale yellow; the postical cross vein straight, the subapical cross vein gently sigmoid, without spur or with but a trace, joining the third vein at right angles.

**ABDOMEN:** Of moderate width, wholly covered with very dense, quite long, fine, pale yellow erect pile that is perhaps suberect in the middle of second and third segments and is long and erect on the fourth. The sides of the abdomen are curled under.

#### TYPE

Holotype, male, British Columbia, Laggan (A.M.N.H.).

#### *Cheilisia nigroapicata* Curran

Figures 29, 71, 97

*Chilosia nigroapicata* CURRAN, 1926, Canadian Ent., vol. 58, p. 173.

A brassy black fly in which the ocular and especially the frontal pile is almost silvery white. The pile on the fourth abdominal segment and posterior part of third is black.

Third antennal segment clear light brownish yellow. Related to *browni*. Length 9 mm.

#### MALE

**HEAD:** Eyes densely, moderately long white pilose, the frontal pile quite long, silvery white, moderately abundant, the crease deep but ending in a pit some distance before juncture, the pubescence seen only obliquely, not affecting the polished ground color. Vertical and occipital pile very pale yellow. Face polished shining black, widely pubescent to cheeks, the tubercle low, deep, subtruncate. Antennae: first segment brown, second and third pale brownish yellow. Arista dark brown, of moderate length, basally thickened, the two basal segments conspicuous.

**THORAX:** Dense and quite long, pale yellowish white pilose on mesonotum, scutellum, and pleura. Only a few black hairs on notopleura, four or five on supra-alae, none on postcalli, one to five on upper mesopleura, none on pteropleura. Pile of scutellum almost equally long on disc and margin, dense, no black hairs present. Mesonotum and scutellum highly shining brassy black.

**LEGS:** The femora black except narrow yellow apices, hind pair unusually slender; black ventral pile almost to base, extensive on outer two-thirds, a very few long pale hairs basally and ventrally, the lateral subdorsal yellow fringe prominent; only black pile on apical fifth. Basal third of hind tibiae, two-fifths or more of other tibiae pale yellow; tibial apices rather narrowly brownish. Anterior basal tarsal segments light yellow laterally, light brownish above. Middle tarsi similar but darker. Hind tarsi dark brown; all of the tarsal pile black above.

**WINGS:** Uniformly light brown, darker near the middle and anterior to the third longitudinal vein in the region of the stigmal cell. Stigma brown. Subapical cross vein slightly sigmoid, not making a right angle with third vein, joining it remote from wing tip.

**ABDOMEN:** Polished black, pile of first, second, and basal two-thirds of third segments pale yellowish white, elsewhere black; pile wholly erect, of moderate length, somewhat longer on posterior part of fourth segment where it is slightly more sparse.

#### DISTRIBUTION

Type, Ontario, Lake Abitibi (holotype); New Brunswick, Harcourt, three males and two females (C.N.C.).

**MATERIAL REVIEWED:** Paratype and an individual from Alberta, Cypress Hills, January 5, 1926.

**RECORDED BY OTHERS:** None.

#### *Cheilosia browni* Curran

Figures 3, 57, 72, 107

*Chilosia browni* CURRAN, 1931, Canadian Ent., vol. 63, p. 96.

A large, brassy black fly with long, yellowish white pile, abdomen with erect dense pile, black beyond the basal part of the third segment. Antennae light brown to orange brown; related to the smaller species, *nigroapicata*. Length 11 mm.

#### MALE

**HEAD:** Eyes densely large, light brown pilose, the pile unusually long. Pile of front and vertex pale yellowish white, almost silvery on the lower part of the front. Three or four black hairs on the occiput behind the ocelli. Front rather protuberant dorsally, that is, somewhat rounded, the medial crease rather deep almost to eye juncture. Front delicately pubescent from an anterior view, but the shining background is not in any way hidden. Face polished shining black with a thin but continuous pubescence almost to the epistoma, stopping in a straight line at the edge of the cheeks. Facial tubercle quite tiny but prominent. Face rather deeply produced, somewhat truncate. Antennae: first two segments shining brown, third segment wider than long, subrectangular above, orange brown in color, the dorsal third darker brown. Arista dark brown, rather short, strongly thickened basally.

**THORAX:** Shining brassy black, rather highly polished, with long, thick, yellowish white pile. The notopleural region and humeri almost wholly blackish pilose, with a considerable patch of black pile above the root of the wing but only a few black hairs among the yellow on the postalar calli. Scutellum concolorous, polished; discal and marginal pile almost equally long, almost white; no black hairs anywhere. Pleural pile pale, a tuft of

blackish or very dark brown pile on the upper part of mesopleura and pteropleura.

**LEGS:** Femora shining black with the black ventral pile of the hind femora reaching to the base where there are just a few short pale bristles; ventrally and basally there are five or six long pale bristles and distributed towards the apex eight or nine long black bristles. There is a prominent fringe of lateral, projecting, long, pale hairs throughout the greater part of the length near the dorsal edge. All of the apical pile black. The hind tibiae black in the middle, basal third yellow, apical fifth or sixth brown. Pile wholly black except narrowly along the inner margin where it is reddish. Tarsi everywhere brown, the dorsal pile of the basitarsi widely black. Fore and middle tibiae with almost the same coloration as the hind tibiae. Apices of the femora narrowly brown or yellow, the middle tarsi a little more yellowish laterally. The hind basitarsi have a row of dark bristles towards the base on the outside.

**WINGS:** Uniformly light brown, somewhat darker before the third longitudinal vein on the outer two-thirds. Posterior cross vein and cell behind it with spurs. The junction of subapical cross vein quite rectangular, remote from wing tip.

**ABDOMEN:** Robust, perhaps slightly wider than the thorax, the pile of the first, second, and basal third of the third segment light yellow, elsewhere black, all of the pile quite long, dense, quite erect.

#### DISTRIBUTION

Type, Ontario, Quebec, one male, July 13, 1929 (holotype); one male, July 14, 1929 (paratype) (C.N.C.).

**MATERIAL REVIEWED:** The paratype.

**RECORDS BY OTHERS:** None.

#### *Cheilusia seripila*, new species

Figures 1, 8, 59, 114, 120

Face straight and almost vertical. Related to *lasiophthalmus*, in which the apex of the third tibia is more narrowly orange, and where long golden bristles replace the partly black ones, below on the hind femora. The mesonotal and abdominal pile is pale yellow; it is golden brown in *lasiophthalmus*; hind basitarsal pile golden. Length 11.5 mm.

#### MALE

**HEAD:** Eyes densely, quite long, light brown pilose. The face and front are shining black, the former with short, sparse pile over the front portion, but with a vertical stripe of longer, thicker pubescence along the anterior margin of the cheeks. The face is deeply produced, the tubercles small, flattened on top, and the face between tubercle and antennae very shallowly excavated. The tubercle lies well below the lower margin of the eye, hence the distance from tubercle to antennae is considerable. The facial strips are brown, quite broad, bare of pubescence, and long pale pilose; the pile is disposed in several rows. The pile on the vertex and the front is wholly yellowish white. Antennae light brownish orange, the end of the short third segment slightly truncate so that the entire third segment appears to be subquadrate. The arista is black without marked pubescence.

**THORAX:** Mesonotum shining black with a faint brassy luster which is not at all marked, the pile is quite long and thick on mesonotum, pleura, and scutellum and almost wholly yellowish white. There are two or three black hairs above the root of the wing, the same number on notopleura, and 12 or 15 mixed with many pale ones on the mesopleura. The scutellar pile is wholly pale, the margin without bristles.

**LEGS:** The femora are dark brownish black, becoming virtually black on the apical third. Their narrow apices are light brown. The anterior and middle tibiae are broadly but diffusely dark brown, but the apical one-eighth of the tibiae as well as the basal portion is yellowish brown. The hind tibiae infuscated very much as the others but perhaps only the basal two-fifths are yellow in color. The tibial pile is wholly pale yellow on all pairs; tarsi blackish brown above, the dorsal, metatarsal pile very dark brown along the middle. Pile of hind femora black throughout along the ventral surface with some black pile along the ventral portion of the lateral surface and becoming black dorsally just before the apex. The inner, lateral pile is yellow, and there is a long horizontal brush of quite long yellow hairs laterally as well as

some distributed along the ventral lateral portion on the basal half.

**WINGS:** Pale brown, more strongly tinged near the middle. The subapical cross vein joins the third vein some distance from the apex and the cross vein has no spurs.

**ABDOMEN:** Shining black, very long, thick, pale yellowish white pilose. On the posterior third of the fourth segment there is some black pile which extends entirely to the posterior corners. There are two or three black hairs in the posterior corners of the third segment but otherwise the lateral marginal pile is pale.

#### FEMALE

Length 11 mm.

**HEAD:** Ocular pile reddish brown, thick, and long; vertical and frontal pile thick, erect, and deep golden, the ground color quite brassy, greenish along the eyes in the middle. Antennae large; first two segments dark brown, third large, orbicular, subtruncate, orange brown. Arista black, nearly bare, face brassy black with very thick, pale yellow pubescence throughout. Eye strips pubescent and golden pilose. Paratubercles are present.

**THORAX:** Mesonotum and scutellum deep shining brassy, in places coppery. The pile is exceedingly thick, long and erect and reddish golden with considerable black pile on notopleura, mesopleura, pteropleura, postcalli, and above the wing but none upon the scutellum.

**LEGS:** Femora black with slight brassy tinge, with a long lateral row of long golden hairs, a few short ventral ones, and more numerous shorter basoventral ones. Ventrally and laterally on apical half there is thick, stiff, black pile including a few longer hairs. Tibiae orange brown, widely brownish black in the middle, hind tibiae wholly golden pilose except for a few black hairs in the middle ventrally, and a few at apex laterally. Tarsi dark brown to black, all segments black pilose above. Wings deeply tinged with brown, especially along the veins on the outer half. Last section of subapical cross vein rather short.

**ABDOMEN:** Wider than thorax, shining black with faint brassy cast, more pronounced basally; on the second and most of the third segment the pile is erect, reddish golden,

becoming shorter in the middles. On the whole of the fourth and all of the fifth segments except the apex it is thick, erect, and black.

#### TYPES

Holotype, male, Washington, Pullman; allotype, female, Oregon, Vernonia, April 13, 1936, Schuh and Gray; and four paratypes, two males, two females, Oregon, Summit Prairie, May 3 (holotype, Hull coll.; allotype, A.M.N.H.).

#### *Cheilosia hiantha*, new species

Figures 9, 13, 77, 101, 102

Large flies with orange micropunctate antennae; frontal, vertical, mesonotal, and scutellar pile wholly pale yellowish or whitish. The pile is shorter than in *lasiophthalmus*; apex of hind tibia black; facial tubercle and profile different. Length 10.5 mm.

#### MALE

**HEAD:** Eyes thickly long, whitish pilose, the vertical and frontal pile entirely long and pale yellowish white. Front with a pronounced medial crease throughout its length. Front and face shining black, the latter with very scanty pubescence except immediately below the antennae. Face without pile, the facial strips fairly wide, with scanty white pile and without pubescence. Antennae pale orange, the dorsal margin with the faintest suggestion of brown, the third segment a little longer than wide and broadly rounded. The arista is dark brown, almost black, slightly thickened basally.

**THORAX:** Mesonotum shining black, thickly covered with erect, moderately long, whitish pile throughout. Pleural and scutellar pile entirely of the same color, or perhaps a little more yellowish. The scutellar margin is without distinct bristles, the marginal and posterior pile of the scutellum is fairly long, abundant, and somewhat longer than that on the remainder of the scutellum.

**LEGS:** Hind femora slender, chiefly black pilose with a few pale hairs laterally and with four or five ventral long pale hairs on the basal half and the middle. Along the ventral margin of the hind femora there is abundant, short, black pile. All of the femora are narrowly brownish at the apex, the tibiae yellowish brown on the basal third, thence black to the apex; although carefully scruti-

nized the immediate apices of the tibiae appear dark brown. Pile of hind tibia almost wholly black, especially on the outer surface. On its inner surface there is a narrow strip of golden pile expanding just before the apex. All of the tarsi dark brown, the hind ones virtually black and the tarsal pile black.

**WINGS:** Chiefly hyaline, with a light diffuse brown area about the middle; stigma brown.

**ABDOMEN:** Oval, convex, shining brassy black, the pile erect, pale yellowish brown along the sides of the abdomen, becoming appressed, shorter, and black broadly down the middle of the abdomen from the beginning of the third segment.

#### FEMALE

Similar to the male, the pile of front and vertex entirely pale yellowish white, the antennae slightly larger, light orange or brownish orange, barely longer than wide with numerous extremely fine punctate places on the third segment. Face oval from in front, a little produced downward and forward; in this respect the species is slightly intermediate in both male and female between the long-faced and the oval-faced types. The pile of the mesonotum is yellowish white, silky, rather thicker and slightly longer than in the male. Scutellar and pleural pile also pale. There is a patch of black hairs in both sexes on the actual wing base, not on the mesonotum. The abdominal pile is similar to that of the male, erect, somewhat more extensively black, especially upon the fourth segment. On the fourth and fifth segments the black pile reaches to the lateral margin.

**LEGS:** Similar to those of the male on the basal ventral part of the hind femora; the black pile is less extensive; the hind tibiae are largely yellow pilose, the black lateral pile chiefly confined to the true ventral and apical portions of the hind tibiae.

**WINGS:** Similar, the brown middle perhaps more evident; the subapical cross vein short, not sigmoid, with a bend, however, in the middle and joining the third vein quite remote from the apex in both sexes.

#### TYPES

Holotype, male; allotype, female, Colorado, Grand Mesa, July 7, 1938, U. Lanham (A.M.N.H.).

#### *Cheilosia lasiophthalmus* Williston

##### Figure 41

*Cheilosia lasiophthalmus* WILLISTON, 1882, Proc. Amer. Phil. Soc., vol. 20, p. 306.

A large shining black species with brassy reflections on the mesonotum. The pile of the front, thorax, and the abdomen virtually all golden yellow; occasionally a few black hairs towards the apex of the fourth abdominal segment. Face rather well produced downward and slightly forward and with a comparatively low tubercle. Pile of the eyes generally yellowish brown but sometimes darker above. Length 9 to 11 mm.

#### MALE

**HEAD:** Pile of eyes long and light brown; vertex and front with long, erect, pale yellow pile. The front is shining black, without apparent pubescence, granulate with a medial crease throughout its length. Antennae light reddish brown on all segments, the third orbicular or slightly truncate apically. The arista is dark brown, thickened on the basal third. The inner surface is very inconspicuously, minutely punctate. The face is rather deeply produced but not nearly so much so as in *ferruginea*, is thickly covered with short, light yellow pubescence over almost the whole of the face. The tubercle is small and low, slanting and equally abrupt above and below and is flattened and truncate apically. The face is thus shallowly concave above; the face strips are pilose but are virtually or almost wholly bare of pubescence.

**THORAX:** The mesonotum is shining black, with a faint brassy tinge, more pronounced upon the scutellum. The pile is long and thick and erect and pale yellow everywhere, no black hairs being present. On the margin of the scutellum there is thick, longer pale hair, but no differentiated bristles.

**LEGS:** The femora are brownish black with the apices narrowly pale yellowish brown; the pile of the hind femora is light yellow on the basal half, with a few black hairs on the distal lateral third, except on the pale-colored part of the apex, and ventrally there are one or two rows of sparse, sharp, setate, black hairs on the distal two-thirds, so hidden by yellow setae as to be scarcely noticeable. There are long, slender, golden yellow, subventral

bristles on the basal two-thirds. Hind tibiae dark brown centrally, the basal third pale yellow, the apex narrowly and obscurely reddish brown. The pile is entirely pale yellow to golden on all of the tibiae. Front and middle tibiae yellowish brown, black in the middles on both sides. First two segments of middle tarsi brownish yellow, remaining segments dark brown. Front and hind tarsi dark brown on the dorsal surface. Hind basitarsal pile golden.

WINGS: Tinged with pale brown, especially along the veins of the basal half and the cross veins. The stigmal cell is brownish yellow, the subapical cross vein joins the third vein remote from the apex and before the end of the marginal cell and joins the pre-apical section at a right angle, and without any trace of spur at base. Lower cross vein with very short spur. Third longitudinal vein decidedly curved. Extreme base of wing yellowish, with golden bristles (brown, with blackish bristles in *robusta*—Alaska).

ABDOMEN: Oval, the pile long only on the sides, rather short in the middle and appressed extensively down the middle of the second and third segments and subappressed beyond. The abdomen is rather convex and shining black with a slight brownish or brassy cast.

#### FEMALE

HEAD: Pile of vertex and front and eyes thick, long, and light shining yellow. Front granulate. There is a slender groove down the middle; the lateral sublunate areas are pitted and quite long. The antennae are similar to those of the male, the apex of the third segment somewhat grayish, the antennae a little larger and with the minute pits much more conspicuous and numerous. The arista is minute pubescent, the tubercle of the face appears to be a little larger but still truncate, a little more abrupt above, leaving the face more deeply concave. It is widely pubescent except on the strips.

THORAX: The mesonotum has thick long pile of a slightly deeper shade of yellow than the male, but not nearly so deep as in *feruginea*. The thick marginal pile of the scutellum is shorter. Mesonotum and scutellum perhaps with a more decided brassy reflection than in the male.

LEGS: In general similar to those of the

male, but the hind femora have no black pile anywhere. All of the pile of the legs is everywhere light golden. There are black spines apically on the middle tibiae and their tarsi. Pale areas of the tibiae more yellowish and clearer. The middle tarsi are yellowish brown on the first two segments. The first two segments of the first tarsi are blackish above.

WINGS: Similar, the first posterior cell shorter on its apical section, the brown of the wing more pronounced beyond the middle and the subapical cross vein without, or rarely with a minute trace of, spur.

ABDOMEN: Shining black with at the most a quite faint brassy reflection. The pile is of similar length to the male on the different areas. It is especially long on the sides of the base of the second segment.

#### DISTRIBUTION

Type, Colorado, 13 males (U.S.N.M.).

MATERIAL REVIEWED: Alaska, Dutch Harbor, one male and two females, July, Mt. Tavelor, two males and one female, Cordova, one female, June; Washington, Tacoma, one male, April; Colorado, Continental Divide, 10,800 feet, two males, June, Long's Peak, one female; Oregon, Summit Prairie, three males and two females, May, Beaver Ranger Station, one female, April; Utah, Logan Dry Canyon, one male, May, quite small; New Hampshire, White Mountains, one male, July.

RECORDS BY OTHERS: Alaska, Coquillett; British Columbia, Vancouver, Osburn; Oregon, Corvallis, Cole-Lovett; Colorado, Ute Creek, Jones; New Hampshire, Johnson, this record probably refers to *rhinoprosopa* or some closely related species.

#### *Cheilosia robusta* Hine

Figures 37, 39, 54, 69, 103, 108

*Chilosia robusta* HINE, 1922, Ohio Jour. Sci., vol. 22, p. 144.

A large, shaggy, pilose species, shining black in color; the mesonotum has a faint brassy reflection. The pile is long and brownish yellow and on the abdomen almost entirely erect. Related to *lasiophthalmus*. Length 11 mm.

#### MALE

HEAD: Eyes densely long, pale brown pilose,



becoming almost whitish below; the long, dense, frontal, and occipital pile pale, whitish on the former, pale yellow above, no black hairs. Front shining black, medial impression very shallow, almost absent. Pubescence visible only obliquely. Face shining black, widely pubescent to the cheek line, the tubercle somewhat less so. Tubercle quite small. Facial strips deeply white pubescent, long white pilose. Antennae: first segment brown, first two shining, last two light brown, third segment broadly orange below, broadly rounded, as wide as long, barely truncate. Arista dark brown, a little thickened basally. One basal segment showing.

**THORAX:** Polished shining brassy black, though faint. The pile quite long, thick, erect, pale yellowish white. Notopleural pile chiefly black, a conspicuous black tuft above wing, a few black hairs on postcalli. Upper half of mesopleural and upper half of pteropleural black. Scutellum with quite long pale yellow pile on the disc and margin; no black hairs.

**LEGS:** Unusually slender; femora black, but little shining, the short black bristles ventrally reaching the base with some sparse, longer black hairs and two or three paler hairs. The lateral pale pile quite long, abundant. There are some pale yellow hairs dorsally, reaching all the way to the apex, and just a few along the sides near the apex. Hind tibiae with basal two-fifths light yellow, the apex narrowly light brown, elsewhere black. Fore and mid tibiae somewhat similar. Pile of tibiae chiefly light brassy yellow, a very few black hairs in the middle of the hind tibiae ventrally. Tarsi dark brown, almost blackish posteriorly. The tarsal pile black above, at least narrowly on the anterior pair and more widely on the posterior ones.

**WINGS:** Uniformly pale brown, very little if any darker basally, the subapical cross vein not quite forming a rectangle, the postical and subapical cross vein, except on the last part of the subapical, rather straight, paralleling the wing margin; there is no subapical spur.

**ABDOMEN:** Very densely erect, rather long, light yellow or light brownish yellow pilose, the middle pile on the third and fourth segments suberect.

#### FEMALE

**HEAD:** Front brassy, somewhat roughened, its pile and the vertical and occipital pile wholly pale brassy yellow. Ocular pile silvery white, pale yellowish above. Face shining black, very faint brassy reflections, thickly long pubescent with a narrow bare line transversely below in the middle of the face. Tubercle large and blunt, antennae light brown, somewhat reddish; the third segment large, perhaps broader than long, with numerous tiny punctures, very bluntly pointed apically, dark brown above, orange below; arista very dark brown, two segments show, one of them narrowly.

**THORAX:** Mesonotum shining brassy black with very thick, though only moderately long, almost wholly pale yellow, mesonotal pile. Only one black, delicate, bristly hair on one side above wing. Pleural pile wholly pale, a little longer. Scutellar pile quite long, the marginal pile twice or more as long as disc, no black hairs, pile erect on all of thorax. Scutellum brassy black.

**LEGS:** Hind femora rather slender, black, but little shining, with only two or three black hairs ventrally in the middle and six or seven somewhat longer, slender, ventral, subapical, black bristles. Dorsal pile and the thick, quite appressed, subapical, wholly brassy pile conspicuous. There is considerable long, subdorsal, outward pile along the sides. Hind tibiae light brownish or yellowish brown on basal two-fifths, narrowly brownish apically, its pile wholly brassy. Other tibiae somewhat less extensively black; basitarsi narrowly and sparsely black on the dorsal sides, but few black hairs on the anterior basitarsi. All of the tarsi, except middle basitarsi, blackish above, yellowish brown on the sides and below. On the outside on the hind basitarsi on apical fifth is a row of some seven or eight black bristles.

**WINGS:** Pale brown throughout, a little darker around the middle cross veins. In other respects similar to those of the male with regard to the cross vein.

**ABDOMEN:** Quite broad and robust, shining black, with very pale brassy reflections along the sides; its pile wholly light brownish yellow, quite erect, very dense, but not especially long.

## DISTRIBUTION

Type, Alaska, Kodiak, Katmai, Snug Harbor, 18 males and 26 females (O.S.U.).

MATERIAL REVIEWED: The paratypes and one from Washington State.

RECORDS BY OTHERS: None.

*Cheilosia hermona*, new species

Figures 16, 51, 90, 115

Medium-sized, greenish black flies, the hind tibiae black nearly to the apex; hind femora thickly black setate ventrally and ventrolaterally. Face polished, almost bare. Wings strongly tinged with brown basally; no black hairs on thorax. Belongs to the *lasiophthalmus* group. Length 8.5 to 9 mm.

## MALE

HEAD: Eyes thickly, long, pale yellow pilose. Vertical, occipital, frontal, and facial strip pile pale yellow. Front shining black without pubescence and with medial groove which is evanescent above. First two segments of antennae dark reddish brown, the third light reddish brown, obscurely tinged dorso-apically with dark brown. Arista short, black, with two basal joints visible, the base narrowly thickened and the whole arista microscopically pubescent. The face is shining polished black, virtually without pubescence even beneath the antennae where there is merely a very faint trace. The tubercle is low, the face a little produced downward and forward and very gently and shallowly concave above the tubercle. The facial strips are without pubescence.

THORAX: Mesonotum and all thoracic pile light yellow. There is no black hair above wing or on scutellum, nor any differentiated bristles on the latter; all of the pile is erect. Ground color of mesonotum and scutellum greenish black and shining.

LEGS: The femora are shining black, the apices quite narrowly brown; the hind femora have only thick black pile throughout the entire ventral surface and this also extends laterally on the lower half of the basal half and over the whole distal and dorsal lateral portions. There are seven or eight yellow bristles basolaterally and some short ones basodorsally, and there is abundant yellow pile medially. The hind tibiae are widely

black in the middle, the apex narrowly and obscurely dark brown, the basal two-fifths almost as dark; the lateral pile is chiefly black, with some golden hairs in the middle, the medial pile golden, the ventral pile, except the apex, black. The middle tibiae are similarly colored, the basal third a little lighter and with less golden. The anterior tibiae have the apex a little more extensively brown medially, the basal third light brown, most of the pile black. The first two segments of the fore and middle tarsi are blackish, their apices obscurely brownish. Hind tarsi black, their basitarsi and all tarsi with black pile above.

WINGS: Strongly tinged with brown about the middle and proximal to the costal cross vein. The stigma brownish yellow. First posterior cell moderately long, only the tip of its cross vein forming a right angle with the pre-apical section of the third longitudinal vein. Its cross vein has a short basal spur.

ABDOMEN: Narrowly oval; not wider, if as wide, as the mesonotum; shining greenish black but subopaque basally in the middle of the second segment. The pile is entirely pale yellow and everywhere erect except for shorter, subappressed hairs down the middle of the second segment, and the pile on either side of the middle of the first segment is rather flat-appressed and directed laterally outward, becoming erect on the edges.

## FEMALE

HEAD: Pile of front and vertex and occiput entirely light golden; of facial strips and eyes whitish, only moderately long on the eyes. The front is greenish black, shining, with wide, thickly punctate, slightly depressed, lunate, ocular marginal areas; the intervening area is striate, sparsely microgranulate, and with a tiny medial pit before the antennae. Antennae colored much as in the male, the third segment a little darker, a little more extensively brownish apically. The face is just barely a little more concave on the upper part beneath the antennae.

THORAX: Mesonotum and scutellum similar, the pile shorter, especially on the scutellum, and on both almost reddish golden.

LEGS: Very similar to those of the male.

WINGS: Similar, perhaps even more tinged with brown, and the distal portion of the

first posterior cell still shorter. The pre-apical section of the third longitudinal vein is scarcely as long as the last section.

ABDOMEN: Similar, but the extreme posterior margin of the third segment has a single fringe of appressed golden hairs, easily overlooked, and the posterior margin of the fourth segment has two or three rows of subappressed yellowish hairs.

#### TYPES

Holotype, male, Oregon, Summit Prairie, May 3, 1939, Schuh and Gray; allotype, female, Oregon, Beaver Ranger Station, April, 1939, Schuh and Gray; three paratypes, males, one, Oregon, Ochocho Ranger Station, May 3, 1939, one, Utah, Mt. Logan, May 23, 1940, one, Logan Dry Canyon, May 23, 1940 (holotype, A.M.N.H.; a paratype, Hull coll.).

#### *Cheilosia julietta* Shannon

##### Figure 46

*Chilosia julietta* SHANNON, 1922, *Insecutor Inscitiae Menstruus*, vol. 10, p. 140.

The type of this species has been examined and the drawing was made of the profile of the head, but on account of limited time the authors were unable to redescribe the species. The short original description follows:

"Female. Fairly large species with rather long dense pile on thorax; eyes pilose, face protruding downward, bare; thorax dark aeneous with brownish pile; abdomen dark aeneous on sides, rather inclined to be broadly opaque black in middle; pile on frons and eyes lutescent to brown; antennae fairly large, reddish brown; third joint quadrate; arista brown, shorter than width of frons. Face shining black, pale pubescent on mouth slopes. Thorax dark aeneous with brownish pile. Femora black with brownish apices; tibiae yellowish basally, darkened on apical half; tarsi darkened. Abdominal pile luteous to brownish. Wings smoky; squamae faintly yellowish, halteres reddish yellow. Length 10.5 mm.; wing 8 mm."

#### DISTRIBUTION

Idaho, Julietta, May 3, 1901, one female, J. M. Aldrich coll. (U.S.N.M.).

RECORDS BY OTHERS: None.

#### *Cheilosia atrocapilla*, new species

##### Figures 7, 67, 83

A shaggy, erect pilose fly in which the antennae and their arista are both pale brownish orange or reddish brown and the hind femora are thickly beset with dense, appressed or subappressed black setae both ventrally and laterally. Black pile upon thorax restricted to four or five hairs and hind basitarsal pile black. Belongs to the *lasiophthalmus* group. Length 11 mm.

#### MALE

HEAD: Eye pile only moderately long and pale yellow. Occipital, vertical, and frontal pile longer, erect, and similarly colored. Front shining black without pubescence. The face is moderately produced downward and forward and shining black with quite sparse yellowish pubescence. Facial strips with yellow pile and no pubescence. The tubercle is quite low, the face gently sloping above. The first antennal segment is brown, the second orange brown, the third segment orange throughout and subquadrate; arista light reddish brown, apparently bare.

THORAX: Shining black with a brassy reflection, the mesonotum, scutellum, and pleura with entirely thick, moderately long, reddish or brownish yellow pile. There are only three or four black hairs which lie above the wing base. Marginal pile of scutellum of about the same length as that on the mesonotum.

LEGS: The femora are black, the apices narrowly brown. The pile is thick, appressed, black, and setate ventrally throughout the entire length of the hind femora and equally thick laterally throughout except upon a slender, diagonal, basal wedge on the basal lateral surface where the pile is longer and yellow. The pile is black on the entire dorsal apical half. The tibiae are all black in the middle, light orange brown basally and more narrowly at the apices. The pile of the hind tibiae is chiefly black on the lateral surface and in the middle ventrally but is golden at the base and medially. There is some extensive black pile on the lateral surface of all of the tibiae. The anterior tarsi are brownish black above, the first two segments of the middle tarsi brown, the remaining ones

blackish. Hind tarsi black. Pile of all of the tarsi black.

**WINGS:** Of moderate length, strongly tinged with brown, especially in the middle. The first posterior cell is short, its cross vein with a short basal spur and joining the strongly curved pre-apical section of the third vein at right angles.

**ABDOMEN:** Shining black with brassy reflections along the sides and apex; it is oval in shape and about the same width as the thorax. The pile is entirely erect and brownish yellow, longer towards the lateral margins, especially on the base. It is, however, subappressed in the middle of the second and the basal middle of the third segment. Hypopygial pile yellow.

#### TYPE

Holotype, male, Washington, Tacoma, April 12, 1933, W. W. Baker coll. (A.M.N.H.).

#### *Cheilosia rhinoprosopa*, new species

Figures 10, 65, 98

A shining black, long, erect pilose species, the mesonotum with slight brassy hue. The antennae and arista are black. The hind femora have considerable black pile beneath, but not to such an extent as in *atrocapilla*. Belongs to the *lasiophthalmus* group. Length 11 mm.

#### MALE

**HEAD:** Ocular pile long and nearly white, upper occipital and vertical pile long and deep yellow. Frontal pile erect and long and pale yellow. The front is shining black without pubescence, microgranulate and with a medial groove throughout its length. The antennae and arista are black, the third segment subquadrate and with a faint trace of reddish on the extreme apex; the pores are exceedingly small, most numerous at the base. Front shining jet black, virtually bare of pubescence except on either side of the antennae above and narrowly bordering the cheeks. Facial strips reddish black with yellow pile and no pubescence. The face is only moderately produced downward and forward, the quite low tubercle leaves the face gently sloping above and shallowly concave.

**THORAX:** Mesonotum and scutellum shining

black with slight brassy reflections, their pile entirely erect, thick and light yellow and moderately long, longer on the anterior portion of the mesonotum and margin of scutellum where there are no differentiated bristles. The sides of the scutellum appear slightly greenish. There are no black hairs anywhere on the mesonotum, pleura, or scutellum.

**LEGS:** Femora are black but narrowly orange brown apically; the tibiae are all widely black in the middle (middle tibiae missing), their bases dull, light brown on one-third and dull, dark brown obscurely and narrowly at the apex of the tibiae on the dorsal surface. The pile of hind tibiae is golden basally and laterally as far as the middle, but it is extensively black dorsoapically and apicolaterally and especially in the middle ventrolaterally. The anterior and posterior tarsi are dark brown to black, entirely with black pile except ventrally. Hind basitarsal pile black above. Pile of anterior tibiae chiefly black laterally and ventrally on the lateral portion.

**WINGS:** Strongly tinged with brown, especially on the veins, stigmal cell, and the middle cross veins. The first posterior cell is of an intermediate type but is fairly short; its cross vein has at most a trace of basal spur or is without, and it joins the nearly straight third longitudinal vein at less than a right angle.

**ABDOMEN:** Narrowly oval, somewhat flattened basally, a little less wide than the thorax and shining black throughout, except that it is subopaque in the middle of the second segment. The pile is entirely erect and wholly light yellow and moderately long. Hypopygial pile pale, with four or five black hairs.

#### TYPE

Holotype, male, New Hampshire, White Mountains, July 24, 1936, W. T. McKean coll. (A.M.N.H.).

#### *Cheilosia chalybescens* Williston

*Chilosia chalybescens* WILLISTON, 1893, Kansas Univ. Quart., vol. 2, p. 76.

A large species with purplish reflections on the abdomen. Face considerably produced downward and somewhat forward. Pile of the mesonotum and scutellum largely yellowish, with a number of black hairs across the

middle from wing base to wing base. Pile of the apical segment of the abdomen long and black. The genital styles elongate. On the female, the pile of the front, mesonotum, and scutellum is all yellowish. Length about 12 mm.

#### MALE

**HEAD:** Vertex and entire upper occiput with black pile. The eyes and the front have long, erect, pale yellow pile, more brownish on the eyes. Front with a shallow medial depression throughout its length, rather wide, shining black with a bluish reflection. Antennae black, the third segment barely longer than wide, grayish brown with the base reddish. The inner surface is quite microscopically punctate. Arista black, microscopically pubescent. Face shining black with faint bluish cast and thickly, short, brownish white pubescent everywhere except on the top of the tubercle. The face is deeply produced, more so than in *lasiophthalmus*, less so than in *ferruginea*. The tubercle is low, small, and truncate, equally abrupt above and below and the face above shallowly concave. The pile of the facial strips is black, the strips themselves white pubescent.

**THORAX:** Mesonotum and scutellum shining black with a faint bluish cast, the pile thick, long, erect, and pale yellow except on the postcalli, above the wing base broadly, and on the notopleura and behind the humeri where it is long and black. Pleural pile almost entirely black, a few yellow hairs behind on the mesopleura. Squamae pale brown with dark brown border and pale yellow fringe. Pile of scutellum wholly pale yellow.

**LEGS:** Almost entirely black, the middle tibiae, their basitarsi, the base of the middle and hind tibiae so dark as to appear almost black. Pile of the legs everywhere black except along the ventral apices of the tibiae and the ventral surfaces of the tarsi.

**WINGS:** Strongly tinged with brown beyond the middle on the anterior half, along the anterior cross vein and the vena spuria. Third longitudinal vein curved, the subapical cross vein joining it at a right angle, remote from wing apex and with a basal spur which may be reduced to a trace or wholly absent. Lower section of first posterior cell shallow. Stigmal cell light brown.

**ABDOMEN:** Oval, rather convex, shining steel bluish to purplish in color. The pile of the first and second segment entirely pale yellowish white and nearly erect, the pile of third and fourth segments becoming longer posteriorly, erect and entirely black. Hypopygial pile black.

#### DISTRIBUTION

Type, California, Washington (U.S.N.M.).

**MATERIAL REVIEWED:** Type, and Washington, Sumner, one male; Oregon, Corvallis, one male; California, Marin County, one male.

**RECORDED BY OTHERS:** Oregon, Corvallis, Cole-Lovett.

#### *Cheilisia ferruginea* Lovett

Figures 2, 112, 113

*Chilosia ferruginea* LOVETT, 1919, Proc. California Acad. Sci., vol. 9, p. 238.

A large black species with a heavy coating of long, yellowish brown to golden pile that is almost reddish in places; a few black hairs on the front, along the sides of the mesonotum, on the pleura, and at the apex of the abdomen, or in the female on the whole fourth and fifth segments. Face is greatly produced downward and slightly forward. The pile of the eyes is long and all black. This species can be separated from *chalybescens* by the color of the abdomen. Length about 12 mm.

#### MALE

**HEAD:** Pile of eyes black and very long and dense; on the vertex and upper occiput and all of the front, except for a tiny area above, with still longer, shining, light brownish yellow pile; the shining black front is microgranulate and bare of pubescence. The antennae are rather small and light orange brown, the third segment orbicular, its dorso-apical margin tinged with dark brown; arista black, micropubescent. Face shining black and very deeply produced with thick, yellowish brown pubescence along the sides and above the tubercle. The tubercle is unusually low, equally abrupt above; the face above it very shallowly concave. The facial strips are wide, black pilose and pubescent only linearly along the ocular edge.

**THORAX:** Broadly through the middle of

the mesonotum the pile is long and erect and light brownish yellow. On the sides of the mesonotum behind the humeri and throughout the lateral margins the pile is long and black; there are, however, a few golden hairs on these areas. Pleural pile very long, chiefly black, with a few yellowish hairs intermixed. Scutellum with very long, thick, entirely yellow hair. Ground color of mesonotum and scutellum shining black with a brassy reflection.

**LEGS:** The slender femora are dark brown with a fringe of very long yellow hairs, quite numerous on the upper lateral margin and with more sparse ones on the ventral lateral margin which are pointed downward. There are, in between, a few long black hairs beginning near the middle, becoming shorter and more abundant laterally towards the apex. The short ventral pile is yellow at the base, black and yellow in the middle, and black apically with subapically on the medial surface a thicker tuft of golden hairs. The tibiae are brownish black except on the basal third where they are yellowish. The pile of the hind tibiae is black at the apex except medially and ventrally, but it is golden laterally to near the apex. There are some black hairs beginning laterally as far as the middle; the middle tibiae have only thick black pile on the ventral apical half, the anterior tibiae with golden pile throughout. The extreme apex of the tibiae is perhaps dark brown. Tarsi brownish black with black pile, the hind basitarsi with black pile.

**WINGS:** Elongate, the apical section of the first posterior cell long, its cross vein without basal spur, or at most a trace, and joining the pre-apical section of the third longitudinal vein at right angles. Whole wing pale brown, scarcely darker about the cross veins. Stigmal cell brownish yellow.

**ABDOMEN:** Widely oval, a little wider than the thorax, shining black, subopaque through the middle of the second segment and with a brassy reflection, especially apically and laterally. The pile is exceedingly long and erect and yellowish brown throughout. It is a little shorter in the middle of the second segment. There are three or four black hairs sometimes on the apical margin of the last segment, and some of the hypopygial hairs are blackish.

#### FEMALE

**HEAD:** In the female the face is not so deep, and its pubescence is yellowish white, the pile of the strips golden, the tubercle slightly larger and with gentle slope above. The antennae are larger, slightly subquadrate, of the same color as in the male but the medial surface is thickly micropunctate. The frontal pile is shorter, but colored as in the male, the ground color quite brassy, granulate in the middle, very thickly punctate along the sides. The ocular pile is brown above and a little more yellowish below towards the front. The mesonotum is strongly tinged with brassy color, its pile a little shorter than in the male but exceedingly thick and erect. It is chiefly shining brownish yellow with, as in the male, black pile along the sides, most abundant over the wing and less of it on the notopleura and very little on the postcalli. There is more golden pile on the pleura. The brassy scutellum has only thick brownish yellow pile, somewhat shorter and, as in the male, is without differentiated bristles.

**LEGS:** Somewhat similar to those of the male in color except that apices of tibiae are narrowly orange brown; the pile is very much the same. On the hind tibiae it is partly black in the middle ventrally but thick and almost entirely golden laterally, and on the dorsal surface there is an isolated, longitudinal strip of thick, flat-appressed, golden pile separated by bare spaces on either side and paralleled by the golden pile of the medial and lateral surfaces. Pile of middle tibiae entirely golden, except for a few black hairs dorsally near the apex.

**WINGS:** Tinged with brown especially along the veins and somewhat deeper in the middle of the wing, about the cross veins and the stigmal cell. The wing is shorter and the apical section of the first posterior cell quite short; otherwise the wings are much the same as in the male.

**ABDOMEN:** Quite broad, with only moderately long, quite thick, yellowish brown pile on the second and all of the third segment except the sides and the narrow posterior margin where it becomes black. All of the pile of the fourth segment is long and erect and black except that there are some brownish golden hairs along the lateral margins.

Pile of fifth segment mixed black and golden. All of the abdominal pile erect.

#### DISTRIBUTION

Type, Oregon, Corvallis, one male (C.A.S.).

MATERIAL REVIEWED: Oregon, Portland, two males, Vernonia, seven males and three females, April; Washington, Hoquiam, one female, May; Satsop, one male; Electron, one male.

RECORDED BY OTHERS: Washington, Hoquiam, Satsop, Cole-Lovett; Oregon, Mary's Peak, Cole-Lovett.

#### *Cheilosia hirsuta*, new species

Figures 117, 118

Belongs to the *lasiophthalmus* group, but is slightly smaller, and the pile is mixed black and yellow. The face is also less produced, and the antennae are much smaller. Related to *nigrovittata* Lovett. Length 9.5 to 10.5 mm.

#### MALE

HEAD: Shining black, the face very lightly coated with white pollen, leaving the tubercle and face below bare. Face considerably produced downward, but less so than on the related species. Pile of the facial strips and cheeks white. Front shining black, silvery pollinose along the eyes, which connects with a large patch just below and to the sides of the antennae. Front rather deeply sulcate, the pile all black. Ocellar triangle shining black, almost as broad as long, the pile black. Occiput rather narrow, with yellowish hairs above, black hairs halfway down, and yellowish hairs below; the cilia black. Eyes brownish black pilose above, almost white pilose below. Antennae small, the first two segments shining black, the third reddish brown, the arista dark brown and very briefly pubescent.

THORAX: Mesonotum shining black with erect, yellowish white pile with a few longer black hairs in the middle becoming all black along the sides. Pile of the scutellum is mostly yellowish, with a few longer black hairs which become quite strong on the rim; the fringe is entirely yellowish. Pleura shining black with very little pollen, pile predominantly black with yellow hairs intermixed.

LEGS: Shining, dark reddish brown to

black, the tibiae broadly yellowish red at the bases and more narrowly at the tips; the femora very narrowly reddish at the tips. Pile mostly black; yellowish shorter hairs at the bases of the femora, on the inside and lower surfaces of the femora, and on the under sides of the tibiae and tarsi.

WINGS: Infuscated with brown, more hyaline between the veins. Squamae whitish with yellow fringe, plumule yellowish, halteres dark brown.

ABDOMEN: Shining black, opaque in the middle on the second and third segments. Pile is all yellowish to white except on the sides of the second segment, where it is long and black and on the opaque areas it is dark brown to black and appressed. Pile of the venter pale and mostly appressed on the third and fourth segments. There are a few black hairs on the genitalia.

#### FEMALE

HEAD: Frontal pile all yellowish except a band of black hairs across the ocelli; also a few black hairs on the lower corners of the front next to the antennae; a depressed area above the arch and side areas also depressed, on which the pile is thicker; a very faint median sulcus. The pile of the occiput is all yellowish, and the black hairs on the eyes are confined to the upper third. The face occasionally has a dozen or more hairs on the slopes, which allies this species with *Chilomyia*; sometimes these hairs are entirely absent. Antennae are larger and more yellowish orange in color. Mesonotal pile nearly all golden, but with some definite black, bristle-like hairs along the sides and on the rim of the scutellum. The pile of the abdomen is more extensively golden, with no black hairs along the sides. The basal two segments of the front and middle tarsi are yellowish orange, and the pile of the legs is mostly all yellowish. The wings are also pale in color.

#### TYPES

Holotype, male; allotype, female; Oregon, Astoria, April 14, Gray and Schuh; paratypes, 19 males and 21 females, Oregon, Vernonia, Astoria, Boiler Bay; Washington, Electron (holotype and allotype, A.M.N.H.; paratypes, Fluke, Hull coll.).



**Cheilosia nigrovittata** Lovett

*Chilosia nigrovittata* LOVETT, 1919, Proc. California Acad. Sci., vol. 9, p. 239.

We have not seen this species, but Dr. E. Gorton Linsley of the entomological staff of the University of California has most kindly carried out for us a critical comparison of the type with its near relative, *hirsuta*. These distinctions are set forth in the key. The brief original description is included:

"Eyes moderately elongate, brown pilose; face but slightly concave, tubercle reduced; body covered with moderately long brown and yellow pile; across dorsum of thorax with well defined band of black pile. Length 10.5 mm.

"Male. Face not produced, very slightly concave to the small obtuse tubercle, with a short shallow concavity before oral margin; cheeks shining black with sparse yellowish brown pile extending around occiput to vertex; frontal and vertical triangles black, swollen, with coarse black pile; frontal triangle with median groove and with fine yellow pile about margin; antennae brownish black, third joint orbicular, greyish shading to dull reddish below; arista black almost to base, thickened on basal fifth; face shining black, bare; eye margins sparsely yellow pilose; greyish pollen below the antennal prominence connected briefly with similar triangular areas at eye margins.

"Thorax and scutellum black, subshining; extreme front of humeral angle with spot of grey pollen; a triangle on dorsum of thorax in front and the hind margin and scutellum with elongate yellow pile; across middle of dorsum, as a black band, and extending forward to the humeral angle the pile is moderately elongate, black, blending into the yellow by a margin of brown; post-alar callosities with black bristly pile.

"Abdomen black, subopaque on disc of first three segments; fourth segment and margin of fifth subshining blue-black; pile throughout moderately long, brown; legs black, knees and proximal third of tibiae brown; pile black, mixed slightly with yellow on front and middle tibia; wings smoky throughout; veins black."

## DISTRIBUTION

Oregon, Corvallis, April 22, 1917, one male, C. Neilson (C.A.S.).

RECORDS BY OTHERS: None.

The two additional specimens from Hoquiam, referred to by Lovett, belong to *hirsuta*. Female unknown.

**Cheilosia punctulata** Hunter

*Chilosia punctulata* HUNTER, 1897, Canadian Ent., vol. 29, p. 128.

"Eyes pilose, arista bare, scutellum wholly without bristles. Everywhere profoundly punctured; wings uniformly, distinctly yellowish.

"Female. Front deeply punctured, wholly without swollen processes, but little shining, pile short, dense, in some lights blackish, from above white. The orbits on the lower part of the front and the upper part of the face expanded as a narrow band just below the base of the antennae, white pollinose. Face bare, shining black, deeply concave below the antennae to the conspicuous round tubercle, thence shortly and deeply concave to the oral margin, which is obliquely truncate. Cheeks narrow, bare, shining, lower border straight. Antennae situated above the centre of the eyes, second and third joints bright reddish yellow (sometimes more brownish), first and the narrow orifice brownish. Third joint moderate, a trifle longer than broad, regularly elliptical. Arista bare, basal, yellow at apex. Eyes very short, sparse, white pilose. Mesonotum densely punctured but little shining, pile short, whitish, on pleura below the base of the wings longer and white. Scutellum without bristles, deeply punctured like the mesonotum, with a loose fringe of fine white pile showing from below the margin. Abdomen broadly elliptical, everywhere deeply and conspicuously punctured and subshining. Pile rather abundant, white. When viewed from above and at one side the pile of the third and fourth segments seems to form broad arcuate bands curving from the apical corner of the segment inwardly. Legs white pilose; all the femora except a narrow tip black; tibiae reddish yellow with an indication of a brown median band, more pronounced on the posterior pair. Tarsi yellow, two apical joints darkened. Posterior femora

with several short spinous bristles below near the apex. Wings short, broad, uniformly tinged with yellow; veins yellow."

"This species is very closely allied to *C. sororia*, Will., from Mexico to *C. petulca* from Washington State. In the shape of the antennae and outline of the face it agrees precisely with *petulca* but differs in the absence of scutellar bristles. This is the only character mentioned by Williston in the B.C.A. as distinguishing *sororia* from *petulca*. The character, however, in this species which leads me to consider it very distinct is the deep punctation. The front of *C. sororia* is described as 'shining metallic,' and the mesonotum as 'metallic green,' which would certainly indicate that these parts are not deeply and closely punctured. In this species the front and mesonotum are very deeply and conspicuously punctured, so that they have a roughened, granular appearance and are subopaque. The wings in this species are much more yellowish than the description of *C. sororia* would seem to indicate they are in that species, and there are several other differences."

#### DISTRIBUTION

Nebraska, West Point, September 9, two females. The location of the types is uncertain or the types have been lost.

The authors believe that they have not seen any individuals that fit the above description. Hunter, who described *punctulata*, went to such pains to emphasize what he calls the "deep, conspicuous punctation" of this fly that in our opinion it must be unique. We therefore consider it a valid species.

#### *Cheilosia aurotecta* Giglio-Tos

*Chilosia aurotecta* GIGLIO-TOS, 1892, Boll. Mus. Zool. Anat. Comp. R. Univ. Torino, vol. 7, p. 4.

We have not seen this species. According to the profile figure of the head given by the author of the species, *aurotecta* has a bituberculate face and consequently it may not be a true *Cheilosia*. The following description is a translation from the original.

"Male: Body 10-12 mm. long; wings 9-10 mm. long. A dark bronze or aeneous colored fly; hairy. Face with two tubercles, the sides with griseous pollen. The third segment of

the antenna is yellow. Eyes with shaggy pile. Thorax and scutellum covered with long black hair; scutellum without setae. Abdomen oval, the first two segments covered with long pile which is whitish at the sides, the remaining pile short and yellowish. The legs are black, the tibiae, except the middle black annulus, and the anterior and posterior metatarsi obscurely ferruginous. The calyptrae are whitish, the wings tinged with yellow.

"Female: The female is distinguished by the wide front which is yellow pilose, the eyes bare below. The pile of thorax golden and rather short. The abdomen, except for the first segments, is thickly covered with long pile."

Described from two males and three females from Orizaba, Mexico.

#### *Chilomyia burkei* Shannon

*Chilosia burkei* SHANNON, 1922, Insecutor Inscitiae Menstruus, vol. 10, p. 141.

This species is properly placed in the subgenus *Chilomyia*. However, as the hairs on the face are few and sparse and easily overlooked, it has been included in the key to *Cheilosia*, *sensu stricto*. In the event that all facial hair is denuded, the species may be recognized by the black ventral fringe on the scutellum. It is a blue black species, known from Colorado, Washington, Oregon, Idaho, and British Columbia.

#### SUBGENUS *HIATOMYIA* SHANNON

*Hiatomyia* SHANNON, 1922, Insecutor Inscitiae Menstruus, vol. 10, p. 126.

These are characteristic flies, black, blue black, brassy, or (rarely) with some yellow on the face or scutellum. The plumose hairs of the arista are of several lengths; between the longer rays there are usually numerous thick, bushy, shorter hairs. The antennae are particularly large, especially in the females, and the third segment is either subquadrate, tapering, and truncate, dorsoapically produced, or short and rounded oval. The tubercle of the face is often prominent and abrupt above. None of the known species has pile on the face. The mesonotum and scutellum have either weak bristly hairs or strong bristles, but the scutellum is never without long, differentiated hairs. The abdominal pile

may be either erect or quite flat-appressed. The legs do not differ in any pronounced respect from those of other subgenera. The wing venation is typical; in one or more species the first posterior cell is quite long and acute, but in all species its apical angle is acute. The nearest Old World equivalent is *Endoiasimyia* Bigot, with heavily pilose eyes, or *Taeniochilosia* Oldenberg, with short, thick pilose arista, of which only three species are known between the two genera.

Of the 22 species of *Hiatomyia* 12 are new species described in this review. Two species have been placed in synonymy. Females are known of all species except one, but males of only 11.

#### THE SPECIES GROUPS OF *Hiatomyia*

The species of *Hiatomyia* are difficult to present in synopsis because one group of species is predominantly, but not wholly, black pilose, and another group is predominantly, but not wholly, pale pilose. However, there are some other respects in which species align into groups rather well, and to aid the student further lists are presented below showing the species that belong in certain species groups:

Species with a large seam upon the third antennal segment

Species with pile of fourth abdominal segment completely flat-appressed

Species with pile of fourth abdominal segment almost wholly erect and pale

Species with light, orange red third antennal segment

Species with pile of basitarsi wholly pale above

Species with markedly dissimilar males and females

Thus far only one species is definitely known from the eastern states or east of Colorado; nearly all species are described from the Pacific states.

#### KEY TO SPECIES OF *Hiatomyia*

##### MALES

1. Rays of arista loose, more or less directed away from the arista, at least over the distal half or more. Loose plumose species . . . 3  
Rays of arista bushy, short, close set, pointed outward more or less in the direction of the arista itself . . . . . 2
2. Pile of front black (Idaho, Washington) . . . . . *signatiseta* Hunter  
Pile of front pale yellow to golden (British Columbia, Washington, Utah) . . . . . *canadensis* Shannon
3. The legs with at least the bases of the tibiae yellowish; often in large part yellowish . . 4  
The legs wholly black, at most a mere trace of dark brown at the tibial base, or in some species the black of the legs may have a brownish cast . . . . . 6
4. Thorax and abdomen strongly shining bluish black. Tarsi and apices of tibiae and front femora yellow, veins of the wings strongly tinged with yellow, especially at the base (Ontario, New Jersey, Wisconsin, Maine, New Hampshire, Maryland) . . . . . *cyanescens* Loew  
Thorax and abdomen brownish black or black tinged with brownish green; never shining bluish. Veins of the wing dark brown . . . 5
5. Anterior and middle tarsi and much of first

<i>chionthrinx</i>	<i>rubroflava</i>
<i>nasica</i>	<i>signatiseta</i>
<i>tessa</i>	<i>idaho-eunicea</i>
<i>hecate</i>	
<i>gemini</i>	<i>chrysothrix</i>
<i>cyanea</i>	<i>nyctichroma</i>
<i>plutonia</i>	
<i>willistoni</i>	<i>cyanea</i>
<i>canadensis</i>	<i>townsendi</i>
<i>signatiseta</i>	<i>nasica</i>
<i>cyanescens</i>	<i>canadensis</i>
<i>townsendi</i>	<i>signatiseta</i>
<i>plutonia</i>	<i>rubroflava</i>
<i>cyanea</i>	<i>hecate</i>
	<i>chrysothrix</i>
<i>canadensis</i>	<i>idaho-eunicea</i>
<i>niveifrons</i>	<i>tessa</i>
<i>hyacintha</i>	
<i>hecate</i>	
<i>gemini</i>	<i>townsendi</i>
<i>plutonia</i>	<i>cyanea</i>

four tibiae yellow; arista long and evenly plumose (California, Oregon) . . . . . *townsendi* Hunter  
Legs almost entirely black or brownish black

- except for tibiae which are narrowly yellowish brown at their base. Arista sparse and straggly plumose (Alaska, British Columbia, Idaho, Washington) . . . . . 11
6. Pile of fourth abdominal segment wholly erect and pale and sometimes with scattered black hairs on the posterior half of third and fourth segments; rather dense and long; third antennal segment wholly black or rarely very dark blackish brown (California) . . . . . 10
- Pile of abdominal fourth segment partly black and partly appressed; considerable black pile present . . . . . 7
7. Third antennal segment clear light orange (Idaho, Washington, Oregon, British Columbia) . . . . . 8
- Third antennal segment dark brown or black or reddish brown, rarely lighter; general color never bluish; black or greenish black instead . . . . . 9
8. Color blue black; facial concavity longer vertically; legs totally black; pile black in middle of third segment erect; first posterior cell less acute . . . . . *cyanea* Hunter
- Color black or greenish black; facial concavity shorter; extreme knees brownish; black pile in middle of third segment flat appressed; first posterior cell more acute. . . . . *plutonia* Hunter
9. Face quite short, apex also quite truncate or subtruncate; facial tubercle small, not deep (Colorado, Washington). *gemini* Shannon
- Distance from eye to epistoma nearly twice as great, the face not shortened and truncate (northwestern states) . . . *plutonia* Hunter
10. Face with a shallow concavity, the distance from antenna to the low tubercle long; mesonotal pile predominantly long and erect and black, with a noticeable amount of yellowish or pale reddish brown, shorter pile; black, erect pile of front longer; pile of fourth abdominal segment much thicker, yellowish white, and sometimes just a few posterior hairs, entirely erect, and rather long; hind basitarsi thicker and more robust (California) . . . . . *willistoni* Snow
- Face with more abrupt and more conspicuous tubercle and deeper, shorter concavity; pile of front shorter; mesonotal pile almost wholly silvery and erect, with some longer black hairs throughout, which are quite numerous on the notopleura; pile of fourth abdominal segment shorter, paler, a little more sparse, and partly appressed posteriorly, with a few black hairs; hind basitarsi smaller, less robust, with only black pile above (California) . . . *tessa*, new species

11. Facial tubercle broad, very low and almost absent; upper distal corner of third antennal segment blackish, but red at the base and rather sharply quadrate; abdominal pile golden (Oregon) . *olivia*, new species
- Facial tubercle more narrow, more prominent; third antennal segment wholly orange, and tapered dorso-apically though truncate; abdominal pile black posterocentrally in the segments and in each posterior corner (Alaska, British Columbia, Idaho, Washington) . . . . . *plutonia* Hunter

## FEMALES

1. Rays of the arista very bushy, short, close set, and dense. Third antennal segment quite large, usually wholly pale orange and bluntly pointed in upper anterior corner, with a prominent slit in inner surface. Frontal pile chiefly pale yellow, a few black hairs intermixed (Idaho, Oregon) . . . . . *signatiseta* Hunter
- Rays of arista loose, more or less directed away from the arista, at least everywhere except the base . . . . . 2
2. Pile of mesonotum chiefly or almost wholly pale brassy or whitish or even reddish; black pile when present most abundant on posterior half. . . . . 3
- Mesonotal pile chiefly or wholly black, sometimes with a narrow anterior band of pale hair, or a few scattered pale hairs . . . 16
3. First four legs including femora almost wholly light yellow or orange . . . . . 4
- Legs chiefly or sometimes wholly black, at least four-fifths of the anterior femora and their tibiae, widely in the middle, dark brown or black . . . . . 5
4. Color greenish black, shining . . . . . 19
- Color blue black, highly shining; scutellum without yellow (Ontario, New England, Maine, New York, Wisconsin, Maryland) . . . . . *cyanescens* Loew
5. Pile of fourth abdominal segment wholly pale yellow or whitish, entirely erect, or rarely a few semi-appressed hairs along the posterior margin. Tibial bases in part yellowish brown, sometimes narrowly. Third antennal segment of large or very large size, a prominent slit on inner surface or with large pores . . . . . 7
- Pile of fourth segment chiefly or wholly appressed, erect pile if present usually confined to the anterior corners. Abdomen often in part black pilose, tibial bases sometimes yellowish, sometimes wholly black . 6
6. Third antennal segment wholly dark brownish black, or dark reddish brown or reddish

- black . . . . . 8  
 Third antennal segment wholly clear light orange, the apical margin sometimes narrowly smoky. . . . . 20
7. Third antennal segment and usually the second wholly, or almost wholly, orange (Oregon) . . . . . *coriacea*, new species  
 These segments blackish, or gray or brownish black . . . . . 25
8. Thoracic and abdominal pile wholly pale, or, if partly black, the scutellum is without black bristles . . . . . 9  
 Thoracic or abdominal pile or both always in part black; scutellar margin always with black bristles . . . . . 10
9. At least the pile of the upper part of front black; third antennal segment round and reddish, the arista brown; hind metatarsal pile dark brown or black on top (Nevada) . . . . . *plumosa* Coquillett  
 Pile of front and vertex, as well as mesonotum and pleura, usually pale golden; bristles of notopleura and supra-alae usually black . 23
10. Pile of front and also vertex wholly silvery or pale yellow; wings hyaline; arista quite loose plumose; antennae reddish black, multiporate, and silvery pubescent; hind basitarsi long and silvery yellow pilose (California) . . . . . *niveifrons*, new species  
 Pile of front pale yellow mixed with longer black hairs, or, if wholly pale, the hind basitarsi are black pilose above; third antennal segment light or dark in color; aristal plumes thicker . . . . . 11
11. At least the last four tibiae wholly black, at most the extreme knees brown; third antennal segment without seam. . . . . 14  
 Base of these tibiae light brown, more narrowly on hind and anterior pairs, the apex of the anterior tibia sometimes light brown. Third antennal segment of moderate size, with conspicuous slit-like seam; hind femora laterally with some yellow pile . . . 12
12. Third antennal segment almost wholly black, slightly reddish at the base, ventrally, and with a serpentine seam and additional pores; mesonotum with almost no black pile; black scutellar bristles weak . . . 13  
 Third segment dark red on all except apical and dorsal margins, with short straight seam and no pores; front almost wholly silvery pilose; mesonotum widely black pilose behind, the black scutellar bristles strong, the fourth abdominal segment entirely silvery pilose, mostly appressed; general color strongly blue black (California) . . . . . *chionthrix*, new species
13. Front with numerous long, erect black hairs among the silvery, shorter, subappressed ones; fourth abdominal segment with much black, completely flat-lying pile in the middle; third antennal segment of average size, the aristal plumes long (Washington) . . *idaho* Shannon *eunicea*, new subspecies  
 Front almost wholly silvery pilose; fourth abdominal segment wholly whitish pilose, the basal half erect; third antennal segment larger, the aristal rays much shorter than usual (California) . . . *tessa*, new species
14. Fourth segment extensively flat black pilose in the middle; a complete, narrow, medial stripe of appressed, brassy pile down the mesonotum and brassy pile anteriorly and posteriorly; third segment without slit-like groove; vertical pile black, but frontal and occipital pile wholly light yellow; scutellar margin with four or five pairs of long black bristles (Colorado) . . . *gemini* Shannon  
 Fourth segment wholly pale pilose; hind femora chiefly short, black pilose laterally . 15
15. Scutellar margin with three pairs of long black bristles; pile of fourth segment long and yellow, but flat lying except along the base (Washington) . . . . . *gemini* Shannon  
 Scutellar margin with two to three pairs of short black bristles; pile of fourth segment sparse, very short and flat, and silvery yellow; ground color black, with slight bluish green luster; wings pale gray, the extreme base and costal cross vein yellowish brown; mesonotal pile very short, flat lying, wholly pale except for two to three notopleural and supra-alar bristles; face polished black, almost without pubescence (California) . . .  
 . . . . . *nyctichroma*, new species
16. Legs largely pale yellow in color, especially on the anterior four (eastern states) . . . . .  
 . . . . . *cyanescens* Loew  
 Legs chiefly or wholly black . . . . . 17
17. The base of the tibiae in part yellow . . 18  
 The tibiae and remainder of legs wholly black (Alaska, Idaho, British Columbia) . . . . . *plutonia* Hunter
18. Color shining blue black; pile of front mostly black (Idaho, Washington, Oregon, British Columbia) . . . . . *cyanea* Hunter  
 Color black, with greenish or aeneous tinge on metallic areas; pile of front mostly yellowish . . . . . *plutonia* Hunter
19. Face and apical half of scutellum more or less yellow or yellowish brown (California, Oregon) . . . . . *townsendi* Hunter  
 Scutellum wholly greenish black (Oregon) . . . . . *hyacintha*, new species
20. Hind basitarsi golden pilose above; hind femora yellowish pilose without erect black pile

- (Oregon) . . . . . *hecate*, new species  
Hind basitarsi black pilose above . . . . . 21
21. Mesonotum silvery pilose with a few long, erect black hairs; third antennal segment extra large, oval, rounded, with deep slit-like sensorium (California) . . . . .  
. . . . . *rubroflava*, new species  
Mesonotum brassy or golden pilose, with or without extensive black pile; third antennal segment never with a large slit . . . . . 22
22. Third antennal segment wholly orange, rather small, or at least no larger than average, the third segment tapered and truncate; mesonotum entirely black appressed setate over the middle of the posterior half except for a narrow medial stripe of golden pile; bases of tibiae narrowly yellowish brown, scutellar bristles long . . . . . *plutonia* Hunter  
Third antennal segment larger than average; oval, the dorsal edge narrowly smoky, the mesonotum almost entirely golden appressed setate with very few black hairs; tibiae almost entirely black, but dark brown at extreme base on close scrutiny; scutellum with two to three pairs of quite short bristles (Oregon) . . . . . *chrysothrix*, new species
23. Hind metatarsal pile dark brown or black on top; third antennal segment blackish, pointed, and the arista black (Nevada) . . . . . *plumosa* Coquillett  
Hind metatarsal pile wholly pale golden; antennae differently colored or shaped . . . . . 24
24. Scutellum with three pairs of long, strong, black bristles; postcalli, notopleura, and vertex with black bristles or hairs; third antennal segment black (Idaho) . . . . .  
. . . . . *idaho* Shannon  
Scutellum, postcalli, and vertex with only golden pile and bristles; notopleura with a single black bristle; third antennal segment pale orange (British Columbia, Washington, Utah, Alberta) . . . . . *canadensis* Shannon
25. Third antennal segment large, the facial tubercle low, broadly rounded (California) . 26  
Third antennal segment still larger, the facial tubercle small; face abruptly descending above and below, knob shaped (Oregon) . . . . . *nasica*, new species
26. Third abdominal segment with a large triangular patch of short, black, subappressed pile; mesonotum with very short, white, or silvery yellow appressed pile; face pubescent (California) . . . . . *nigrocyanea*, new species  
Third abdominal segment pale pilose, or, if black, the mesonotum has rather long, erect or nearly erect pile, brassy with some black hairs intermixed (California) . . . . .  
. . . . . *willistoni* Snow

***Hiatomyia willistoni* Snow**

Figure 149

*Chilosia willistoni* SNOW, 1895, Kansas Univ. Quart., vol. 3, p. 227.*Chilosia lugubris* WILLISTON, 1886, Bull. U. S. Natl. Mus., vol. 31, p. 45 (*nec* Zetterstedt).

Shining black flies with small, low-set tubercle. Third antennal segment large and reddish black, silvery pubescent, with many micropunctures and a large sensorial furrow. Pile of fourth segment of abdomen wholly erect and pale. Related to *nasica*, the antennae are yet much smaller. Length 8 to 9 mm.

**MALE**

Wholly black, including the antennae. Pile of the front and vertex black. Pile of the mesonotum erect and mostly white, but with black hairs along the sides. Pile of the scutellum white with a few black hairs intermixed, the rim with about five pairs of black bristles. Pile of the fourth tergite white and all erect.

**FEMALE**

Third segment of the antennae larger and dark orange in color. Pile of the front silvery with longer black hairs at the vertex. Pile of the mesonotum short, mostly white, appressed but with numerous more erect black hairs. Black bristles along the sides, the thorax, and on the rim of the scutellum. The legs all black except the knees which are reddish yellow.

**DISTRIBUTION**

Type, California, two males (U.S.N.M.).

**MATERIAL REVIEWED:** California, Walnut Creek, two males and two females, May, Davidson; Lone Pine, one male, June; Tahoe, one male, July; Inyo County, one male, June.

**RECORDS BY OTHERS:** Oregon, Hood River, Corvallis, Cole-Lovett; Colorado, Jones; British Columbia, Port Renfrew, Glacier, Osburn; Washington, Seattle, Osburn; North Carolina, Metcalf. This last record we believe requires confirmation.

***Hiatomyia gemini* Shannon**

Figure 139

*Hiatomyia gemini* SHANNON, 1922, Insector Inscitiae Menstruus, vol. 10, p. 133 (key only).

A shining black species in which the legs

are entirely black. Third antennal segment ranges from dark reddish with blackish dorso-apical margin and more reddish base, to wholly brownish black. Related to *plutonia*, the facial tubercle is differently constricted and is abrupt and produced above as well as below; moreover the pile of the abdomen is very long and shaggy in the male on the sides and apex, and is much shorter in *plutonia*. In *plutonia* the third antennal segment is orange. Length about 8 mm.

#### MALE

Pile of the front, vertex, and cilia all black. Pile of the mesonotum long, shaggy, mostly black along the sides but with many white hairs on the disc. Rim of the scutellum with long, black, bristle-like hair, the discal hairs mostly white, but with many black hairs present. Pile of the legs is mostly black, with a few white hairs near the bases of the femora. Wings dark brownish on the basal third, gradually becoming paler towards the tip. Abdomen shining along the sides and on the disc of the fourth tergite. The pile mostly black and appressed down the middle, but erect and patched black and white along the sides.

#### FEMALE

Pile of the front mostly yellowish, with black hairs intermixed; hairs of the vertex all black. Pile of the mesonotum appressed, rather golden in color, but with many black hairs, especially along the sides. The rim of the scutellum has about 10 strong black bristles, the discal pile mostly golden and somewhat flat. Abdominal pile mostly flat, white along the sides, black down the middle; on the fourth segment it is completely flat, lying against the segment, except narrowly in the anterior corner. The ground color is greenish black.

#### DISTRIBUTION

Type, Colorado, no locality, 7000–8000 feet altitude (U.S.N.M.).

MATERIAL REVIEWED: Type, and Colorado, Cameron Pass, 21 males and females, July; North Park, seven males and five females, July; Red Mountain Pass, two males, July; Grand Mesa, one male, July; Washington, Mt. Rainier, F. M. Hull.

RECORDS BY OTHERS: None.

#### *Hiatomyia cyanea* Hunter

Figures 156, 171

*Chilosia cyanea* HUNTER, 1896, Canadian Ent., vol. 28, p. 228.

A dark, blue black species with bright orange third antennal segment. Related to *plutonia*, but the central pile of the third and fourth segments (as well as the remainder), which is flat appressed in *plutonia*, is entirely erect. The front is very scantily gray pubescent in the male, the ground color shining through; brassy pile is confined to the apical half of the medial surface of the hind tibia. Length 7 to 9 mm.

#### MALE

Shining black, with the pile of the front, vertex, mesonotum, and disc of the scutellum all erect and black. The antennae are yellow to reddish with the first two segments blackish. The bristles on the rim of the scutellum are rather long and black, but the fringe is yellow. The hairs along the sides of the mesonotum are quite strong but scarcely bristle-like except for two or three on the calli. Legs almost entirely black.

#### FEMALE

Highly shining and mostly blue black. Antennae larger and with a short irregular seam on the lower corner of the third segment, rays of the arista long, loose, and covering all but the apical fourth. Pile of the mesonotum short, mostly black, and appressed. Bristles along the sides and on the scutellum very strong and black, a rather heavy tuft of black bristles on the upper edge of the mesopleura.

#### DISTRIBUTION

Type, Idaho, Moscow, one female (location of type uncertain or type lost).

MATERIAL REVIEWED: Washington, Mt. Rainier, one male and one female; Tipson Lake, one male, July; Paradise Inn, one male; Oregon, Lick Creek National Forest, one male, 4600 feet, August; Milton, one male, June.

RECORDED BY OTHERS: British Columbia, Port Renfrew, Osburn.

#### *Hiatomyia plutonia* Hunter

*Chilosia plutonia* HUNTER, 1897, Canadian Ent., vol. 29, p. 125, male.



*Chilosia gracilis* HUNTER, 1897, Canadian Ent., vol. 29, p. 126, female.

Black flies, with faint greenish cast and bright orange third antennal segment. Related to *cyanea* but not blue black. Brassy pile extends narrowly the full length of the medial surface of the hind tibia. Length 7 to 8 mm.

#### MALE

A black species in which the antennae are small and only the basal corners of the third segment somewhat reddish brown. The pile of the mesonotum is mostly black, with a few white hairs intermixed along the front. On the scutellum there are numerous strong, bristle-like hairs. Legs entirely black. Wings tinged with brownish.

#### FEMALE

Third segment of antennae slightly larger, and the frontal pile has scattered black hairs but many shorter yellowish hairs intermixed. Mesonotum and scutellum with short appressed yellow pile but with numerous slightly longer black hairs intermixed; strong black bristles on the rim of the scutellum with short appressed yellow pile but with numerous slightly longer black hairs intermixed; strong black bristles on the rim of the scutellum.

#### DISTRIBUTION

Type, Alaska, Cook's Inlet, one male (location of types uncertain or types lost).

MATERIAL REVIEWED: Alaska, Popoff, one female; Katmai, one male, July; Snug Harbor, one male, June; Juneau, one female, June; Idaho, Moscow, one female, June, F. M. Hull; Washington, Alta Vista Ridge, one male, August; Paradise Inn, 10 males and two females.

RECORDED BY OTHERS: British Columbia, Port Renfrew, Osburn. The single female type of *gracilis* was also from Cook's Inlet; we believe it is the female of *plutonia*.

#### *Hiatomyia niveifrons*, new species

Pale, pilose flies. The pile in general brassy white, appressed on the sides of the mesonotum, erect on the sides and base of the fourth segment and appressed posteriorly. Related to *canadensis*. Antennae are dark brown. Length 8 mm.

#### FEMALE

HEAD: Face and front greenish black, the latter unusually flattened, undifferentiated along the eye margins and with a faint, medial impression on the lower half. The face has a conspicuous tubercle, is very deeply excavated above, the strips are narrow, pubescent, and whitish pilose; the face is sparsely pubescent. The antennae are dark brown, the third segment longer than wide, with numerous fine punctures; there is one larger, basal series of connected punctures. Arista nearly black with about 15 loose rays above. The pile of the vertex is long and black, with a few shorter pale hairs. The frontal pile is abundant, rather long, subappressed on the edges, and almost wholly whitish. There are one or two black hairs above the antennae and a trace of whitish pubescence there.

THORAX: Mesonotum shining greenish black and densely, flat appressed, yellowish white pilose. There are one or two black hairs above the wing base, five pairs of delicate black bristles on the scutellar margin; the scutellar discal pile is appressed and, together with the pleural, pile wholly pale.

LEGS: Black, the narrow base of the hind tibiae, the basal two-thirds of the front and middle tibiae, and their narrow apices light brown. The anterior and middle tarsi except for the last joint light brown; posterior tarsi black. All of the tarsal pile including the metatarsi and all the tibial pile pale yellowish white. Hind femora yellowish white pilose with some black pile ventrally on the apical half.

WINGS: Very pale brown; stigmal cell brownish yellow.

ABDOMEN: Broad, greenish black, the pile in the anterior basal corners widely erect, pale yellowish white, almost to the base of the mid point, the remaining pile of each segment flat appressed and black on the second and third segments but pale on the fourth segment.

#### TYPES

Holotype, female, and paratype, female, California, Devil's Post Pile National Monument (holotype, U.M.; paratype, Hull coll.); one paratype, female, California, Lake of Woods, April 19, 1931, E. O. Essig

(A.M.N.H.); Lone Pine, July 28, 1940, Lipovsky, three males, one female.

***Hiatomyia hyacintha*, new species**

Figures 136, 145

Characterized by the short face and large, low tubercle; hind basitarsal pile golden; mesonotal and scutellar pile flat appressed and golden, both with four or five central black hairs, the latter with three pairs of strong black bristles. Related to *canadensis*. Length 7 mm.

**FEMALE**

**HEAD:** Front flattened, only moderately wide, shining brassy black, with a faint medial impression only on the anterior third. Pile of vertex black, of front sparse, short, and golden, erect, with a few longer golden hairs and at least 12 or 15 slender, long, black hairs on the anterior part. Face short, the tubercle not large, broadly and bluntly rounded, the face considerably excavated above the tubercle, the lower part of the face, as well as beneath the antennae, grayish white pubescent. Facial strips conspicuously grayish white pubescent and without any trace of pile, in contrast to *hecate* where, although there is some pubescence, there is thick, long, conspicuous pale yellow pile on the facial strip. Ground color of face shining black, with a suggestion of reddish or mahogany about the oral margin. Antennae dark brown, the third segment at least half again as long as wide, slightly reddish in the extreme basal ventral corner. Pile of second segment black, of first yellow, at least on one side. Arista black, strongly thickened near the base, with about 16 dorsal, long, loose rays.

**THORAX:** Mesonotum brassy or a greenish black, its pile and that of the pleura and all of the scutellum except the scutellar bristles pale brassy yellow. Scattered throughout the mesonotal pile are some extremely slender black hairs; there are more of them just before the scutellum, a small patch of five or six black bristles above the root of the wing, and three or four long bristles on the postcalli. Pile of mesonotum definitely subappressed but not flat appressed.

**LEGS:** Chiefly shining dark brown or black; the apices of the femora narrowly, all of the middle tibiae except an obscure median black

cloud, basal two-fifths of anterior tibiae, their apical fifth, and the narrow base of hind tibiae, light orange brown; the very narrow apex of the hind tibiae is brown; hind tarsi blackish brown, and the four anterior tarsi entirely light brownish yellow. Pile of hind tibiae and hind basitarsi and anterior basitarsi entirely light golden or brassy.

**WINGS:** Light gray, the veins dark brown, the stigma brown. Subapical cross vein long, the basal section rounded without any trace of spur; it joins the third vein at an acute angle some distance from the margin.

**ABDOMEN:** Oval, somewhat flattened, pale yellow pilose on the sides, broadly black appressed pilose in the middle. The terminal part of the abdomen is destroyed from the end of the third segment.

**TYPE**

Holotype, female, Oregon, Queen Mine, above Cornucopia, 5000 feet, August, 1937 (A.M.N.H.).

***Hiatomyia cyanescens* Loew**

Figure 168

*Chilosia cyanescens* LOEW, 1863, Berliner Ent. Zeitschr., vol. 7, p. 67.

*Chilosia plumata* LOEW, 1863, Berliner Ent. Zeitschr., vol. 7, p. 68.

A shining, strongly blue black species with erect black pile on the mesonotum on the male, but with very short, sparse, flat pile on the female. Both sexes have strong scutellar bristles, and the legs are almost all pale in the female, but considerably darker in the male. In the male, there is a conspicuous, pre-apical, opaque band on the second tergite; otherwise the abdomen is entirely shiny. The female abdomen is very highly polished, with fine, white pile. The upper mouth edge and tubercle of the female are conspicuously yellow. It is a common eastern species occurring in early spring. Length 6.5 to 7.5 mm.

**MALE**

Shining blue black. Facial tubercle rather low, the entire face lightly coated with white pollen. Antennae rather small, but the third segment slightly elongate and light orange in color, slightly darker in the upper third; the rays of the arista rather loose and covering

the basal three-fourths. Pile of the front, vertex, and mesonotum all black and erect; strong bristles along the sides and apex of the scutellum. Abdomen highly polished, small opaque bands on the second and third tergites, the pile mostly white.

#### FEMALE

Upper mouth edge and sometimes the tubercle often tinged with yellowish to reddish color. Antennae more elongate and larger with only a small shallow seam. Frontal pile short and almost pure white. Mesonotal pile very short, mostly black and appressed. Scutellar bristles very strong and black. Abdomen entirely polished. Legs almost entirely yellow; only the hind tarsi, medial ring on the hind tibiae, and apical half of the hind femora black.

#### DISTRIBUTION

Type, Illinois, one male (M.C.Z.); type of *plumata* Loew, Virginia, one female (M.C.Z.).

MATERIAL REVIEWED: Ontario, Orillia, one male and one female; New Jersey, New Brunswick, one female; Wisconsin, Sturgeon Bay, one female; Madison, seven males and eight females, May-July.

RECORDED BY OTHERS: Maine, Oquossac; New Hampshire, White Mountains, Franconia; Massachusetts, Chester; Connecticut, by Johnson; Maryland, by Banks, Greene, etc.; New York, by Leonard; Wisconsin, Milwaukee and Dane counties, by Fluke.

#### *Hiatomyia plumosa* Coquillett

##### Figure 138

*Chilosia plumosa* COQUILLET, 1905, *Invertebrata Pacifica*, vol. 1, p. 25.

This species is related to *canadensis*, and as in that species, there are no black bristles on the scutellum. Its hind basitarsal pile is black. Since we have not redescribed the type, we give the author's brief description:

"Black, with a bluish tinge, the third segment of antennae except the apex reddish yellow, halteres light yellow; hairs on upper half of front rather long and black, those on the remainder short and chiefly whitish, upper part of face deeply excavated, the tubercle very prominent and rather pointed, sides of face bearing a series of whitish hairs, eyes

bare, third joint of antennae rather large, ellipsoidal, arista rather sparsely long plumose, hairs of body whitish, scutellum without black marginal bristles, abdomen polished; wings hyaline, the base and stigma yellowish, veins blackish, calypteres white. Length 5.5 mm. Nev. Type no. 6711 U.S.N.M."

#### DISTRIBUTION

Nevada, one female (U.S.N.M.).

MATERIAL STUDIED: The type.

RECORDED BY OTHERS: From British Columbia by Osburn, but in view of the large number of species, this requires confirmation.

#### *Hiatomyia canadensis* Shannon

##### Figure 157

*Hiatomyia canadensis* SHANNON, 1922, *Insector Inscitiae Menstruus*, vol. 10, p. 133 (in key only).

A pale brassy pilose fly with yellowish antennae. Hind basitarsi pale pilose. Related to *idaho*; the bristles of the scutellum are pale golden. Length 6.5 to 7.5 mm.

#### MALE

HEAD: Eyes bare, pile of vertex and of the bluish black front long and entirely erect and pale yellow. Front with a deep medial crease and yellowish pubescence. The small antennae are light yellow to orange, the last two segments darker, the third segment subquadrate with rounded edges, the blackish arista strongly thickened at the base with rather short, thick, blackish rays and loose, longer ones. The face is shining black with yellowish pubescence, except on the moderately prominent tubercle, which is most abrupt on the lower side. Facial strips both pilose and pubescent.

THORAX: Mesonotum shining black with perhaps a faint brassy cast or in places a little greenish; the pile of the mesonotum and scutellum and pleura is entirely thick and long and erect and light, shining yellow except that there are four or five black hairs on the notopleura, one above wing base and sometimes one on the postcalli. Squamae whitish with pale yellow fringe and border. Abdomen oval, convex, shining brassy black, with thick, rather long, almost entirely erect, light yellow

pile. There is a little appressed yellow pile posterocentrally on the second and third segments and over the entire posterior margin of the fourth segment.

**LEGS:** Femora dark shining brown to black, the apices narrowly orange brown, the pile pale yellow except that on the hind femora there is a row of sparse, black, bristly hairs on the ventral surface only and excluding the basal fifth. The tibiae are brownish black, the base of the hind tibiae quite narrowly, and the base of the other tibiae a little more widely, yellowish brown. Tarsi brownish black, the pile of the hind basitarsi entirely pale golden.

**WINGS:** With a yellowish tinge, especially upon the base. The subapical cross vein joins the third longitudinal vein at an acute angle; both lower cross veins are usually spurred. Stigmal cell yellow.

#### FEMALE

**HEAD:** Similar to that of the male, the front brassy black with rather reddish yellow pile which is nearly erect and situated on a flattened front; or the pile may be semi-erect and quite pale yellow and the lower half of the front somewhat more raised. In any case the pile of front and vertex and occiput is entirely pale. The antennae have the third segment bright orange, somewhat larger than in the male and with the same shape; or the antennae may be a little smaller and quite rounded oval. The third segment has a definite seam near the lower basal corner. Arista similar to that of male.

**THORAX:** The pile is shorter than in the male, deep shining yellow with a tinge of red, and semi-erect, but almost entirely erect anteriorly, and there may be a few short black hairs on extreme anterior margin. The pleural pile and scutellar pile are wholly pale; the scutellum has four pairs of longer yellow bristles.

**ABDOMEN:** Almost circular in shape from above, and in this case considerably wider than in the thorax; or it may be broadly oval and no wider than the thorax. The abdominal pile is entirely light yellow, erect on the sides of the second and the anterior corners of the third and fourth segment, and extensively flat-appressed elsewhere.

**LEGS AND WINGS:** Similar to those of the male.

#### DISTRIBUTION

Type, British Columbia, London Hill Mine, Bear Lake, July 29, 1903, 7000 feet, female (U.S.N.M.).

**MATERIAL REVIEWED:** The types, and British Columbia, Cranbrook, one female, July; Washington, Mt. Rainier, 21 males and eight females, July, F. M. Hull coll.; Utah Logan Canyon, one male.

**RECORDED BY OTHERS:** None.

***Hiatomyia nasica*, new species**

Figures 124, 150, 169

Recognized by the enormous antennae which have a prominent seam-like sensorium on the inner side. Frontal pile is yellow and black mixed, mesonotal pile mostly yellow and erect; bristles along the sides and on the rim of the scutellum black. Related to *willistoni*. Length 9 mm.

#### FEMALE

**HEAD:** Front quite flattened, granulate, with scarcely any medial impression even on the lower part, the pile thick, light silky yellow, rather appressed in a forward direction, with numerous longer, slender, and more erect black hairs. The vertical pile is chiefly black, with short golden pile on the post occiput. Upper part of occiput and indeed the whole occiput conspicuously densely covered with grayish white pubescence. Face shining black with a quite tiny, stubby, but conspicuous tubercle that is somewhat flattened on top and equally excavated above and below; it is situated closer to the oral margin than to the antennae. Face with considerable light yellowish or pale brownish pubescence, the narrow facial strip apparently bare of pubescence but with conspicuously long, yellow pale pile. The lower part of face is short. Antennae enormous, the third segment, if possible, larger than that found in the female of *signatiseta*; it has a long, curved, reddish crease in the inner surface and a light red stripe bordering this crease below. Arista slightly thickened basally with some eight or 10 sparse long hairs above. Color of antennae black on the first two segments, brownish black with very pale yellow pubescence on

the third segment, the pubescence quite conspicuous. The inner surface of the third segment has many microscopic punctures.

**THORAX:** Mesonotum shining brassy black but not pronouncedly. Pile erect on the anterior half, subappressed posteriorly, chiefly golden or brassy yellow. There is some black pile scattered throughout. There are four stout black bristles above the wing base, two long and two or more short ones on the notopleura; three long and two short ones on the postcalli, a small tuft on the upper part of the mesopleura, and four pairs on the margin of the scutellum; all black. Posterior pair of scutellar bristles widely separated. Pile on the disc of the scutellum brassy yellow or brown, appressed towards the midline; there is considerable brassy yellow pile on the posterior margin beside the black bristles. Pleural pile except as mentioned wholly pale. Squamae whitish with orange border and pale yellow fringe.

**LEGS:** Black, the narrow apices of the femora, basal fourth of hind tibiae, two-fifths of mid-tibiae, and third of anterior tibiae yellow. Remainder of tibiae including apices black, all of the tarsi black. Hind basitarsi considerably thickened, their dorsal pile and that of the anterior basitarsi widely and extensively black above. The pile of the rather thick hind femora is in large part light brassy, with some black ventral pile. The ventral pile is entirely black along the middle and apex, its lateral apical pile black. Hind tibial pile on external and true dorsal surfaces black; on ventral surfaces, except near the base and on the inner surface, golden.

**WINGS:** Strongly tinged with brown, the stigma yellowish brown, the brown of the wing extending over the entire anterior border and more faintly on the posterior half. Subapical cross vein nearly straight, joining third vein at less than a right angle, the initial section rounded and without trace of spur.

**ABDOMEN:** Quite broad, somewhat flattened in the middle, convex on the sides and posteriorly, considerably broader at the end of the second segment than across the thorax. The color of the abdomen is brassy black, entirely light yellowish brown pilose, the pile quite short in the middle of the second and third segments where it is subappressed;

elsewhere it is wholly erect except that it is subappressed in the extreme posterior corners of the third and fourth segments.

#### TYPE

Holotype, female, Oregon, Talent, April 26, 1925 (A.M.N.H.).

*Hiatomyia townsendi* Hunter

Figure 141

*Chilosia townsendi* HUNTER, 1896, Canadian Ent., vol. 28, p. 94.

Flies with, in the female, legs almost wholly light brownish yellow, their hind femora blackish subapically. Scutellum yellow apically with strong black bristles; face in part yellow. Male with light brown legs becoming in part yellow on the tibiae. Related to *cyanescens* through the acute distal angle of the long first posterior cell of the wing, these flies are, however, very different in color. Length 8 to 10 mm.

#### MALE

Antennae peculiarly shaped, the fore margin of the third segment slightly concave and the lower margin convex, the rays of the arista long and loose. Pile of the front and vertex black; mesonotum black with brownish hairs intermixed in the middle; pile of the scutellum black, with a few shorter pale hairs along the anterior margin, and with strong black shining bristles on the rim. The abdomen of the male is more slender than in other species, and is shining greenish black, the posterior margins of the segments widely subopaque.

#### FEMALE

Lower sides of the face yellow. Antennae not so strongly sword-shaped, the fore margin of the third segment almost straight. The humeri and apex of the scutellum yellow. Mesonotal pile strongly appressed; mostly yellow with some black hairs intermixed, bristles along the sides, and on the scutellum strong and black. Legs mostly reddish orange. This is the only species we know of in which the scutellum of the female is yellow at the tip.

#### DISTRIBUTION

Type, California, Marin County, one male (C.A.S.).

MATERIAL REVIEWED: California, Walnut Creek, five males and three females, Davidson; Corville, Trinity County, one male, 2400 feet, June; Oregon, Mary's Peak, one female, July.

RECORDED BY OTHERS: California, by Davidson.

***Hiatomyia hecate*, new species**

Figures 130, 140, 164

Antennae reddish orange, the rays of the arista short and covering the basal half; frontal pile golden, mesonotal pile golden and somewhat appressed; scutellar bristles yellow. Fourth tergite with yellow pile except for a few black hairs near the anterior margin. Related to *rubroflava*, a species in which the pile is whitish. Length 8 mm.

FEMALE

HEAD: Pile of front and vertex and facial strips entirely golden. The front is broad, shining brassy black, with a faint medial impressed line from ocelli to lunule, becoming a little deeper anteriorly. Just before the ocelli is a shallow, broad, transverse depression. The face is shining black, with a large round tubercle that is deeply excavated above. The antennae are light reddish brown, with a strong transverse slit on the inner surface reaching to the second segment; pile of first segment golden; the arista black, quite thick on the basal third, the rays short and relatively thick, though not so bushy as in *signatiseta*.

THORAX: Mesonotum shining, with a strong brassy reflection; the pile on the mesonotum, pleura, and scutellum entirely a rich golden color, almost reddish in places. Mesonotal pile slightly subappressed on the posterior half. Margin of scutellum with several pairs of moderately long, reddish golden bristles.

LEGS: Shining black, the apices of the femora, the basal fifth only of the hind tibiae, third or more of the middle tibiae, and anterior tibiae, light orange brown; hind tarsi black, others dark brown; ventral half of anterior tarsi reddish. Pile of hind tibiae, femora, and all of hind basitarsi and fore basitarsi golden. Squamae light brownish orange with yellow fringe.

WINGS: Strongly tinged with orange due

to the color of the veins on the basal half. Stigma yellow.

ABDOMEN: Oval, convex; the pile, except in the middle of the second and third segments, wholly brassy or golden, black in the middle of these segments. Pile of fourth segment wholly pale, erect on the basal third, subappressed apically.

TYPE

Holotype, female, Oregon, Milton, June 22, 1938, Gray and Schuh (A.M.N.H.).

***Hiatomyia rubroflava*, new species**

Figures 123, 143, 173

Characterized by the quite large, pale orange, third antennal segment, in which there is a deep sensorial seam. Related to *willistoni* but with differently colored antennae. Length 7 mm.

FEMALE

HEAD: Front quite flat, somewhat roughened, rather broad; the abundant pile is chiefly silvery in which are mixed a few fine, slender, black hairs. Pile of vertex about ocelli almost wholly fine, long, and black. There are two or three quite long black hairs on the post-ocellar occiput among the abundant silvery pile of the occiput. Face highly polished black, pubescent along the sides, the cheeks and the broad but not prominent tubercle shining bare. Facial strip rather wide, silvery pilose, perhaps with a sparse pubescence, but it is not evident. The first antennal segments are black, virtually touching; second segment dark brown, a little shiny, the third segment quite large, flattened, longer than wide, oval, broadly rounded, wholly pale orange with at most a faint suggestion of gray along the anterior edge. On the inner surface there is a deep slit as long as the second segment; arista black, strongly thickened basally, with about 12 hairs sparsely distributed along the dorsal edge.

THORAX: Mesonotum short, appressed pale yellowish white pilose and almost silvery, the pile quite short and flat appressed. There are a very few fine, erect black hairs scattered across the anterior part of mesonotum, and 10 or 12 longer ones on the posterior half. There are three large and one small black notopleural bristles, four small ones about

the wing, and two postcallar ones. Scutellum black and rough, its discal pile pale yellowish white, flat appressed towards the center, the margin with four pairs of rather strong, long tuberculate bristles and a fifth more delicate one basally.

**LEGS:** Black, shining, only the extreme apices of the femora narrowly dark brown; the tibiae are black, only their extreme bases dark brown, those of middle tibiae a little more extensively so. The apices of all the tibiae are black; all tarsi black, the pile of all basitarsi black above, pale brassy beneath. There are apparently no lateral setae on hind basitarsi. Pile of hind femora chiefly black, some pale pile ventrally on the basal half and the subdorsal pile on the basal half pale but short.

**WINGS:** Pale gray, the stigma yellow, the costal cell and wing base beyond base of basal cell brown. Base of subcostal and marginal cells pale; postical and subapical cross vein virtually straight, the subapical cross vein without any spur whatever, joining the third vein at a 67-degree angle.

**ABDOMEN:** With yellowish white pile, quite flat appressed except on the sides of the second segment and the extreme anterior corners of the other segments. We are unable to determine positively whether there is any black pile in the middle of the third segment, but there appears to be none.

#### TYPE

Holotype, female, California, Tamarack, July, 7700 feet, E. O. Essig (U.S.N.M.).

#### *Hiatomyia signatiseta* Hunter

Figures 132, 146

*Chilosia signatiseta* HUNTER, 1896, Canadian Ent., vol. 28, p. 227.

Easily recognized by the heavy, strap-like appearance of the arista; the rays are shorter than in other allied species but are thicker and are somewhat appressed. The third segment of the antennae of the male is yellowish in color and has an almost straight upper edge but a well-rounded lower edge; in the female, the antennae are very large and have a deep seam. The pile of the mesonotum in both sexes is somewhat shaggy, erect, with white hairs and longer black hairs intermixed. Length 7 to 8 mm.

This species is not closely related to other North American members of this genus. It is related to the European *Taeniochilosia atriseta* Oldenberg, however, which may be regarded as a species with a more highly developed version of the short, dense plumose arista.

#### DISTRIBUTION

Type, Idaho, Moscow Mountain, three males and females (location of types uncertain or types lost).

**MATERIAL REVIEWED:** Idaho, Moscow Mountain, three males and one female; Washington, Mt. Rainier, 64 males and females, July, F. M. Hull.

**RECORDED BY OTHERS:** Oregon, Hood River, Cole-Lovett.

#### *Hiatomyia chionthrix*, new species

Figures 125, 144, 165

A bluish black insect with deep facial concavity, thickly pubescent face, and large, dark red antennae with strong basal seam. The pile of the fourth abdominal segment is wholly silvery white and almost entirely flat appressed except along the base. Related to *willistoni*. Length 7 mm.

#### FEMALE

**HEAD:** The vertical pile is long and black, with a few black hairs on the upper occiput among the short white ones. The pile of the front is thick and white and subappressed except for two or three black hairs near the ocelli. The front is flat and granulate and slightly bluish black, and on the lower part of the front there is a slightly curved, very low, transverse ridge on either side which is connected medially below by a shallow crease. The antennae are unusually large, very dark red, the apex and dorsal margin narrowly blackish brown, the pubescence is yellowish brown, and basally there is a large, short, straight seam. The arista is black, short, and loosely plumose. The face is shining black, widely pubescent, with large, rounded tubercle which is abrupt above; the concavity is deep.

**THORAX:** The mesonotum and scutellum are shining black, with slight bluish cast and short, appressed, yellowish white pile. There are only a few slender, longer, black hairs



anteriorly which are scarcely noticeable but short; black pile becomes much more abundant in the middle on the posterior half, and there are also a few longer black hairs. Post-cellar pile yellowish, with five long black bristles. The scutellar pile is almost entirely appressed and pale yellow, with a few short black hairs and on the margin three pairs of stout but short black bristles and basally three pairs of still shorter ones. The pleural pile is pale, with a tuft of backward-directed black hairs at the top of the mesopleura.

**LEGS:** Black, the basal third of the anterior tibiae, two-fifths of the middle tibiae, and a sixth of hind tibiae yellowish brown. The extreme apices of front and middle tibiae are brownish. The tarsi are black, the pile of all segments is black above; the pile of the hind femora is almost entirely black, and there are only a few yellowish hairs laterally close to the base, although there is short yellow pile medially upon the basal half. The tibial pile is black except medially.

**WINGS:** Moderately elongate, pale brown, not darker in the middle or base except proximal to the costal cross vein; stigmal cell yellow.

**ABDOMEN:** Quite widely oval and short and flattened in the middle of the second and third segments; it is shining bluish black in color, a little subopaque in the middle of the second segment, the pile of the second and third segments is extensively flat appressed, especially in the middle posteriorly where it is black. On the third segment it is erect in the anterior corners, more deeply sublaterally, and erect pile extends narrowly almost to the middle. This leaves the posterior pile black, margined diagonally in front with pale whitish pile. The pile of the fourth segment is entirely pale, almost whitish and entirely flat appressed except for a narrow, crescentic, basal band of pile reaching on each side to the middle.

#### TYPE

Holotype, female, California, Upper Echo Lake, 7400 feet, July 6, 1934, E. O. Essig (A.M.N.H.).

*Hiatomyia nyctichroma*, new species

Figures 134, 148, 162

A black species with faint bluish green

luster on the mesonotum, and the base of the wing strongly yellowish brown. The antennae are light orange brown basally and dark brown on the apical border and without any large pores or seams. Related to *gemi*. Length 6.5 mm.

#### FEMALE

**HEAD:** The pile of front and vertex is silvery whitish, with one or two black hairs on either side of the occiput above. The ground color of the front is shining black and flat and granulate, with scarcely any trace of transverse swellings and with a mere trace of a medial, anterior groove. The antennae are black with the third segment of only average size and widely orange brown at the base but dark brown just below the arista and on the apical third and narrowly along the dorsal margin; pores seem to be absent. The pubescence is almost white, the arista with loose blackish rays. The face is polished, shining black with virtually no pubescence and with deep concavity and a moderately prominent tubercle, which is equally abrupt above and below.

**THORAX:** The mesonotum and scutellum are quite short, entirely flat appressed and pale yellow pilose. The only black hairs are two slender bristles on notopleura, one on postcalli, two on upper mesopleura, two short hairs over the wing base, and three pairs of short, black bristles on the scutellar margin. There is a bluish green reflection. The halteres are light orange brown throughout, the squamae white with pale yellow border and fringe.

**LEGS:** Almost entirely black pilose including the hind femora; there is some brassy pile distally on the hind tibiae, on the whole medial surface of the anterior tibiae and on a slender, posterior row of pale hairs along the middle femora; all tarsi with brassy pile beneath. All the tarsi are black pilose above.

**WINGS:** Very pale brownish hyaline throughout but strongly yellowish brown proximal to and including the costal cross vein. Stigmal cell is short; its almost straight cross vein has a spur.

**ABDOMEN:** Rather short, widely oval, and nearly circular; it is flattened in the middle of the base and has very short pile which is appressed in the middle of the second seg-

ment; the pile of the second segment appears to be almost wholly pale and with a few black hairs along the posterior margin in the middle of that segment. On the third segment there is extensive, black, flat-appressed pile throughout the middle of the segment, widening posteriorly; this still leaves perhaps the lateral third pale. On the fourth segment the pile appears to be entirely pale yellowish white, flat lying, and exceedingly short. There are perhaps three or four black hairs basally in the middle, and erect short pile is almost absent, with a narrow trace of it present along the base. The surface is strongly granulate.

#### TYPE

Holotype, female, California, Trinity County, Big Flat, Coffee Creek, June 21, 1934, T. G. H. Aitken (A.M.N.H.).

#### *Hiatomyia chrysothrix*, new species

Figures 135, 147, 167

A black fly with reddish golden pile on the mesonotum and short, polished black face, pale yellowish white front and large, chiefly orange, third antennal segment. The wing is strongly tinged with orange brown on the basal half. Related to *hecate*, but the legs are wholly black, the frontal pile is nearly white, and the abdominal pile exceedingly short. Length 6.5 mm.

#### FEMALE

**HEAD:** Front, vertex, and occiput with pale yellow, almost white pile; frontal pile abundant and appressed. The front is moderately shining black, flat, granulate, and virtually without trace of swellings or crease. The first two segments of the antennae are sepia, the third unusually large, oval, light orange, and slightly smoky brown narrowly along the dorso-apical margin. There are no large seams, but there are numerous minute pores. Arista sparsely and loosely plumose and black. The face is short, polished black, with a trace of pubescence bordering the cheek and a trace beside the eyes opposite the antennae. The tubercle is quite low, the concavity rather shallow but short.

**THORAX:** Pile of mesonotum and scutellum entirely flat appressed; short reddish golden with two short black hairs on the notopleura,

three or four above the wing, two on postcalli, three on upper mesopleura, and three pairs of quite short, stout bristles on the margin of the scutellum. The ground color is shining black.

**LEGS:** Entirely black except that at the extreme base of the anterior and middle tibiae they are dark brownish sepia; the pile is chiefly black, and there are some short, sparse, reddish yellow pile ventrolaterally on the basal half of the hind femora and a few similar hairs dorsolaterally on the basal half. On the middle femora posteriorly, and on the anterior femora both anteriorly and posteriorly, there is pale pile together with a little black pile. Pile of the hind tibiae entirely black but growing yellowish to reddish distally on the medial surface and on the entire medial surface of the anterior tibiae. Pile of all of the tarsi black above, brassy below; the hind basitarsi are more robust than usual.

**WINGS:** Short, strongly tinged with brown on the basal half. The stigmal cell is brownish yellow; the distal section of the first posterior cell is quite short and its cross vein has a spur.

**ABDOMEN:** Short, widely oval, rather convex and a little flattened in the middle of the base. It is shining black, with a slightly bluish green luster. The pile is exceedingly short and almost wholly flat appressed. On the third and fourth segments there is erect pile which is confined to a narrow basal band which barely reaches the anterior corner on the third segment and does not reach it on the fourth. The pile is widely flat and black posteriorly in the middle of the second segment and again on the third segment for more of the length of the segment, but it is entirely pale yellow on the fourth and fifth segments.

#### TYPE

Holotype, female, Oregon, Crater Lake, Sun Meadows Creek, 6500–7000 feet, September 3, 1930, H. A. Scullen (A.M.N.H.).

#### *Hiatomyia tessa*, new species

Figures 126, 127, 154, 155, 163, 166

A shining black species with a faint trace of bluish luster. The pile is chiefly silvery white, the antennae almost black, the basitarsi black pilose above. Related to *willisstoni*. Length 7 mm.

## MALE

**HEAD:** The pile of the occiput, vertex, and front is erect, black, and long but not so long as in *willistoni*; the vertical pile is directed forward. The front has a medial crease throughout, its sides protuberant. The antennae are unicolorous and virtually black and small, with pale yellowish brown pubescence; they are tapered and apically subtruncate. The arista is black, with short, loose plumes. The face has a low but conspicuous tubercle which is equally abrupt above and below; the facial concavity is deep and short.

**THORAX:** The mesonotum is shining black with long, erect, silvery pile and longer, stiff black pile. The notopleura are almost entirely black pilose with numerous black hairs over the wing, four very long and some shorter black hairs on postcalli. There are a number of slender, black hairs on the scutellar disc together with short white ones and six or seven pairs of marginal and submarginal, long, slender black hairs or bristles. The pleura have numerous black hairs on the upper mesopleura but only three on the pteropleura; remainder of pleural pile white.

**LEGS:** Black, the hind femora slender, the extreme base of the anterior and middle tibiae diffusely dark brown, almost black. The pile of the legs is chiefly black; it is rather long on the hind femora and erect except at the apex. On the hind femora there are pale hairs basally, laterally, and medially and only a few pale hairs ventrally at the extreme base. The pile of the hind tibiae is black but pale brassy throughout the medial surface and at least narrowly towards the base and throughout the medial surface of the anterior tibiae. All the tarsi are black pilose above.

**WINGS:** Pale brownish hyaline, not noticeably darker in the middle or base; stigmal cell pale brown. The wings are elongate.

**ABDOMEN:** Oval, shining black, with perhaps a faint bluish luster; it is widely subopaque in the middle of the second and third segments. The pile is quite short and chiefly erect with very little appressed pile in the middle of the third segment. The pile on the fourth segment appears to be a little more sparse; it is certainly shorter, and a little more pale than in *willistoni*, and there are a few appressed pale hairs posteriorly on this segment, as well as four or five black ones.

## FEMALE

**HEAD:** The pile of the upper occiput and vertex is long and black; it is entirely silvery on the granulate, slightly swollen front except for three or four black hairs near the ocelli. The color is shining black; there is a slight V-shaped excavation in front of the antennae. The antennae are larger than usual, and the third segment is short oval and reddish black; the extreme ventral base is a little more reddish, with a conspicuous, nearly straight, seam-like pore that is bipunctate on one antenna. The arista is blackish, the rays much shorter than usual; the pubescence is yellowish white. The face is shining black with a conspicuous tubercle quite abrupt above, and the concavity is extra deep and short.

**THORAX:** Mesonotum and scutellum shining black, with very short appressed pile from pale yellow to reddish brown with a little black pile in the middle on the posterior part where there is also an occasional long, slender black hair. There are three long bristles on the postcalli and three on the notopleura, together with a few shorter black hairs. There are six on the upper mesopleura, several over the wing base, and on the scutellar margin there are three pairs of rather stout, moderately long, black bristles; its discal pile is pale.

**LEGS:** Black, the extreme base of all of the tibiae brown. Pile of legs chiefly black. The pile on the hind femora is quite short but a little longer above on the basal half; it is almost entirely short, black, and setate ventrally and is chiefly black laterally. Pile of hind tibiae black but brassy throughout the medial surface and again on the anterior tibiae. All the tarsi are black pilose above.

**WINGS:** Brownish hyaline, darker in the middle and at the extreme base; the distal section of the first posterior cell is of medium length, its cross vein without spur.

**ABDOMEN:** Nearly circular, convex posteriorly and a little flattened between the second and third segments. The pile is quite short, widely flat appressed and black on middle posterior triangles on second and third segments, leaving considerable erect pile laterally and in the anterior corners, and posteriorly erect pale pile. The pile of the fourth and fifth segments is entirely yellowish

white and is erect over the basal half. Ground color of abdomen slightly bluish greenish black.

#### TYPE

Holotype, male, allotype, female, California, Devil's Post Pile National Monument, August 27, 1937, E. G. Anderson (U.M.).

#### *Hiatomyia idahoa* Shannon

Figure 137

*Hiatomyia idahoa* SHANNON, 1922, *Insecutor Inscitiae* Menstruus, vol. 10, p. 132 (in key only).

The author did not describe this species, which is mentioned by key only. We have illustrated the type but have not been able to redescribe it. It is related to *canadensis*, but the margin of the scutellum has three pairs of long, strong, black bristles, and moreover the third antennal segment is blackish. The pile of front, mesonotum, and scutellum is light golden, with black bristly hairs on the postcalli, notopleura, and vertex.

#### DISTRIBUTION

Type, Idaho, Julietta, male, March 3, 1901; allotype, female, Moscow, May 22, 1913, J. M. Aldrich (U.S.N.M.).

MATERIAL REVIEWED: The types.

RECORDED BY OTHERS: None.

#### *Hiatomyia idahoa eunicea*, new subspecies

Figures 133, 151

A shining, black fly with almost entirely black antennae; the front and mesonotum have a slight brassy luster; the tubercle is large but low, the concavity deep; the scutellum has a pair of short apical yellow bristles and several basal black ones. Fourth abdominal segment with much flattened black pile. Base and apex of tibiae narrowly yellowish brown except on the hind pair. All tarsi yellow pilose above. Length 7 mm.

#### FEMALE

HEAD: The front is brassy black and scarcely granulate, with numerous quite long, erect black hairs and about as many subappressed white ones. There are no swellings, but in front of the antennae there is a short, very shallow, bare, widely spear-shaped depression which is continued as a narrow, bare, non-excavated streak up the middle of

the front. The pile of the occiput is silvery with three long slender black hairs on either side above and several just behind the ocelli. The pile between and in front of the ocelli is white. The antennae are of average size, black, the extreme ventral base reddish black with a prominent serpentine seam. The pubescence is pale yellowish brown, the arista black with long loose rays.

THORAX: Mesonotum and scutellum shining black, slightly brassy or perhaps faintly greenish, with almost wholly subappressed yellowish to pale reddish brown pile. There are some scattered erect black hairs anteriorly, four long ones on the notopleura, several above the base of the wing, three long and two short ones on the postcalli, a few in front of the scutellum, and more numerous short, suberect black pile in the middle of the posterior half of the mesonotum. The discal pile of the scutellum is almost wholly pale, with short yellow hair on the margin; there are a pair of short, yellow, apical bristles and three slender, black pairs of lateral bristles. The pleural pile is pale yellow, with only three long black bristles on the upper mesopleura. Anteriorly the pile of the mesonotum is almost erect, the squamae are white with pale yellow fringe and borders, and the halteres are yellow with orange red knobs.

LEGS: Black, the extreme base of the hind tibiae and apex of their femora, the narrow base and apex of the anterior tibiae and apex of middle tibiae, and apices of both their femora are yellowish brown and diffuse. The base of the middle tibiae is slightly more extensively yellowish brown. The pile of the hind femora is extensively appressed and yellow laterally and throughout the dorsal surface and almost entirely yellow ventrally upon the basal half. It is more or less erect basally. There are numerous short black setae ventro-apically. The hind tibiae are pale golden pilose throughout except for five long black stout hairs laterally. The first two segments of the anterior tarsi and the middle tarsi are dark brown; all the remaining tarsal segments are blackish and all the tarsi pale yellow pilose above.

WINGS: Pale brownish gray hyaline, not darker in the center or base; the stigmal cell is brownish yellow, the wings are rather long, the long apical section of the first posterior

cell has its cross vein straight and without any trace of spur.

**ABDOMEN:** Oval and flattened and shining blackish. The pile is very widely black and flat appressed posteriorly over the middle of the second segment and again throughout the middle of the third and fourth segments. The erect pale yellow pile reaches the sides of the third and fourth segments rather widely. The posterior corners have appressed yellowish pile. Pile of fifth segment wholly pale, appressed on the posterior half, bare on the basal fifth.

#### TYPE

Holotype, female, Washington, Mt. Rainier, 6000 feet, August, 1938, R. C. Osburn (O.S.U.).

#### *Hiatomyia coriacea*, new species

Figures 128, 142, 152, 153, 170

A bright brassy fly, its pile completely yellow except for black scutellar bristles and some black ones on mesopleura, notopleura, and postcalli. Antennae bright orange. Related to *signatiseta* Hunter, the arista is sparse and medium long plumose instead of short, thick, and bushy. Length 8 mm.

#### FEMALE

**HEAD:** Pile of upper occiput short and golden yet with numerous long, slender, black hairs. The vertex has a few long black hairs and still fewer yellow ones. The pile of the front is entirely light golden except for four slender black hairs just in front of the ocelli; the middle frontal pile is erect, the pile bordering the eyes is appressed, the upper half of the front is flattened, the lower half is slightly protuberant and medially very shallowly creased. The antennae are bright orange, with a slight trace of smoky brown at the upper apex of the third segment. The third segment is unusually large, perhaps even larger than in *signatiseta*, and is nearly rectangular; its outer angles are only a little rounded. The black arista has about 10 short loose plumes above and about the same number below. There is a long, prominent sensorial fissure on the third segment. The face is short, the concavity shallow but deep, the tubercle small and rounded and equally abrupt above and below. There is considerable pubescence on the lower sides of the face and some on the

upper part. The facial strips are pubescent on the upper portion and brassy pilose.

**THORAX:** Brassy black, the pile short, erect in front of the suture, but rather strongly appressed behind, particularly so in front of the scutellum. There are 15 or 20 very slender, scattered black hairs on the posterior half of the mesonotum divided between the two sides. The scutellar discal pile is entirely golden and strongly appressed and has four pairs of long, slender black bristles on the margin. There are four long and two short black bristles on the postcalli, three long and two short ones on the notopleura, two long ones only above the wing, and five on the upper part of the mesopleura.

**LEGS:** Brownish black, the apices of the femora yellowish brown, the basal third of the hind tibiae yellowish, the remainder brownish black. The basal half of the middle tibiae and its extreme apex and the basal third of the anterior tibiae and its apex yellow. All the tarsi are dark brown to blackish, the pile of all the basitarsi black on the upper surface. The pile of the hind femora is short and golden ventrally on the basal half but black on the outer half; laterally the pile is almost entirely golden with only a few black hairs near the apex. The pile of the hind tibiae is chiefly golden, but there is black throughout its length laterally on the dorsal half.

**WINGS:** Nearly hyaline, the stigmal cell yellow; there is a minute, short, inward spur just below the middle of the subapical cross vein in both wings; it has no basal spur.

**ABDOMEN:** Oval and bright brassy in color, the pile wholly yellowish to yellowish brown and entirely erect except for the posterior middles of the second and third segments where there is some flat appressed pile.

#### TYPES

Holotype, female, Oregon, Hood River, May 8, 1917, F. R. Cole, collector, and two paratypes, females, May 7, June 21 (holotype, A.M.N.H.).

The two additional individuals vary very slightly, the May 7 female has a few black hairs throughout the entire front, the third antennal segment is oblique at the apex instead of rectangular, its hind tibiae are perhaps a little less extensively yellow. The

June 21 individual also has some black pile throughout the front, its third antennal segment is oval rounded, its dorsal and apical margin blackish, and its hind tibiae are less extensively yellow at base; it may be distinct.

***Hiatomyia olivia*, new species**

Figures 84, 129

A black fly with very low, broad, almost absent facial tubercle, which together with the golden pile of the abdomen distinguishes it from the male sex in *plutonia* Hunter. Length 8.5 mm.

**MALE**

**HEAD:** Pile of the upper part of the occiput long and black with some short golden hairs behind; the pile of the front and vertex is quite long and black. The front is moderately shining, with a bluish green luster and a deep medial crease. The first two segments of the antennae are nearly black, with slight reddish brown cast; the third segment is brownish black, becoming rather bright red on a small basal area below. This segment is sharply rectangular dorsally at the apex. The black arista is sparsely short plumose, the face is shining black, with perhaps a faint bluish or greenish luster and is thickly white pubescent, including the facial strips which are also pale yellowish pilose. The tubercle of the face is exceedingly low, almost absent, and the face is short.

**THORAX:** Mesonotum and scutellum shining black, with greenish luster that becomes brassy immediately above the wing and behind the humeri. The pile is quite thick and long and erect and about half black and half brassy yellow; the yellow pile is considerably shorter, the pile on the scutellum is much longer with very few yellowish hairs which are confined to the front; the marginal hairs are quite long though questionably classed as bristles. The ventral fringe is yellow. Squamae yellow, the fringe golden, the pteropleural pile and almost all the mesopleural pile very long and black.

**LEGS:** Black, the apices of the femora narrowly brownish, the pile of the hind femora black throughout ventrally and almost entirely black laterally and dorsally; at the extreme base there are a few long slender brassy hairs laterally and dorsally, and the hind trochanters are thickly brassy pilose.

The tibiae are black; only the basal fourth of the anterior tibiae is light yellowish brown and diffuse, and the immediate base of the middle and hind tibiae is diffusely reddish brown. The pile of the hind tibiae is black except for appressed golden hair medially on the distal half. All the tarsi blackish and everywhere black pilose except ventrally. The hind basitarsi are rather thickened.

**WINGS:** Pale grayish hyaline, the stigmal cell brownish yellow, the wings discolored by some slight incrustation; the distal section of the first posterior cell moderately long, its angle acute; the subapical cross vein without a basal spur.

**ABDOMEN:** Partly denuded on one side of the third and fourth segments, but apparently the pile was everywhere quite long and erect and bright golden except that in the middle of the third segment on the posterior part and the middle of the fourth segment on the basal part there were a few suberect hairs.

**TYPE**

Holotype, male, Oregon, Corvallis, April 6, 1900, J. C. Bridwell (A.M.N.H.).

***Hiatomyia nigrocyanea*, new species**

Figures 131, 158, 172

Characterized by its blue greenish black coloration and the short, appressed, silvery yellow pile of the mesonotum; the black antennae are rather large, the third segment with two large pores; upper tarsal pile all black. Distinguished from *tesa* by the almost wholly erect pile of the fourth abdominal segment and the pubescent face; from *willistoni* by the mesonotal pile. Length 6.5 mm.

**FEMALE**

**HEAD:** Upper occiput with seven slender long black hairs on either side, four in the middle and with silvery pile behind. The pile of the front and vertex is silvery, with a few slender black hairs on the vertex and upper sixth of front. The front is more or less flattened, slightly elevated across the middle, with slender, very shallow medial depressions, and the ground color shining bluish black and granulate. The ocular margins are narrowly punctate, and this area has subappressed pile, the remainder of the frontal pile nearly erect. The first segment of the

antennae is black, second reddish black, the third rather large, black, and oval, with yellowish gray pubescence and a large basal slit which may be divided into two large punctures on either side. The black arista is quite sparsely diagonally short plumose. The face is shining black, the tubercle large, rounded, prominent, the concavity deep, the face rather well produced and thickly white pubescent; the strips are without pubescence but are white pilose.

**THORAX:** Mesonotum and scutellum shining bluish black with quite short, very thick, flat-appressed, white pile. There are two or three black bristles on the notopleura, three or four above the wing, three long and two short on the postcalli, three or four on upper part of mesopleura, and three pairs of moderately long black bristles on the margin of the scutellum. The pteropleural pile is entirely yellowish, the squamae white, the fringe yellow, the halteres pale orange.

**LEGS:** Black, only the bases of the tibiae narrowly and diffusely, and the extreme apices of the femora, light brown. The pile of the

hind femora is chiefly black, with a few yellowish hairs basally and a very few dorso-apically among the black. All the tarsi are black and black pilose above.

**WINGS:** Pale brown throughout, the stigmal cell yellow, the distal angle of the first posterior cell acute, the subapical cross vein without a basal spur.

**ABDOMEN:** Almost circular, flattened in the middle of the second and third segments, and shining black with a bluish or blue greenish luster; the pile is short, entirely erect, and whitish except for abundant, flat-appressed, black pile in the middle of the second segment on the posterior half and widely throughout the middle of the third segment. The pile of the fourth segment, however, is entirely erect and pale except for one row of whitish subappressed hairs on the posterior margin.

#### TYPE

Holotype, female, California, Fresno County, Huntington, July 16, 1919, 7000 feet, E. P. Van Duzee (A.M.N.H.).

### SPECIES WITH EXTRALIMITAL GENERIC POSITION

#### *Endoiasimya indiana* Bigot

Figure 161

*Endoiasimya indiana* BIGOT, 1882, Ann. Soc. Ent. France, ser. 6, vol. 11, p. cxxxvi.

The authors examined the type of this species in the British Museum. It proves to be a hairy-eyed *Cheilosia* with plumose arista. It therefore has equal validity with *Hiatomyia* and should rank as either genus or subgenus depending upon the views of the author. *Sonanomyia* Shiraki is an exact synonym. There are only two known species in the genus, of which *indiana* Bigot is the genotype.

#### *Taeniochilosia atriseta* Oldenberg

Figures 159, 160

*Taeniochilosia atriseta* OLDENBERG, 1916, Wiener Ent. Zeitg., vol. 35, p. 101.

An inspection of Oldenberg's figures will show that *Taeniochilosia* is closely related to *Hiatomyia*. Indeed it is a variant of *Hiatomyia* in which the antennal plumulae are very thick-set and bushy; in some respects the North American *Hiatomyia signatiseta* Hunter is similar to it.

#### *Chilomyia livida* Wehr

*Chilosia livida* WEHR, 1922, Univ. Studies, Lincoln, Nebraska, vol. 22, p. 24.

This species has been included among the *Cheilosia* because it sometimes appears to lack the distinguishing pile on the face. This species is readily distinguished by its uniform white pile. There are no black bristles on the scutellum, and it is a larger but more slender species than the pale-pilose eastern *Chilomyia primoveris* Shannon.

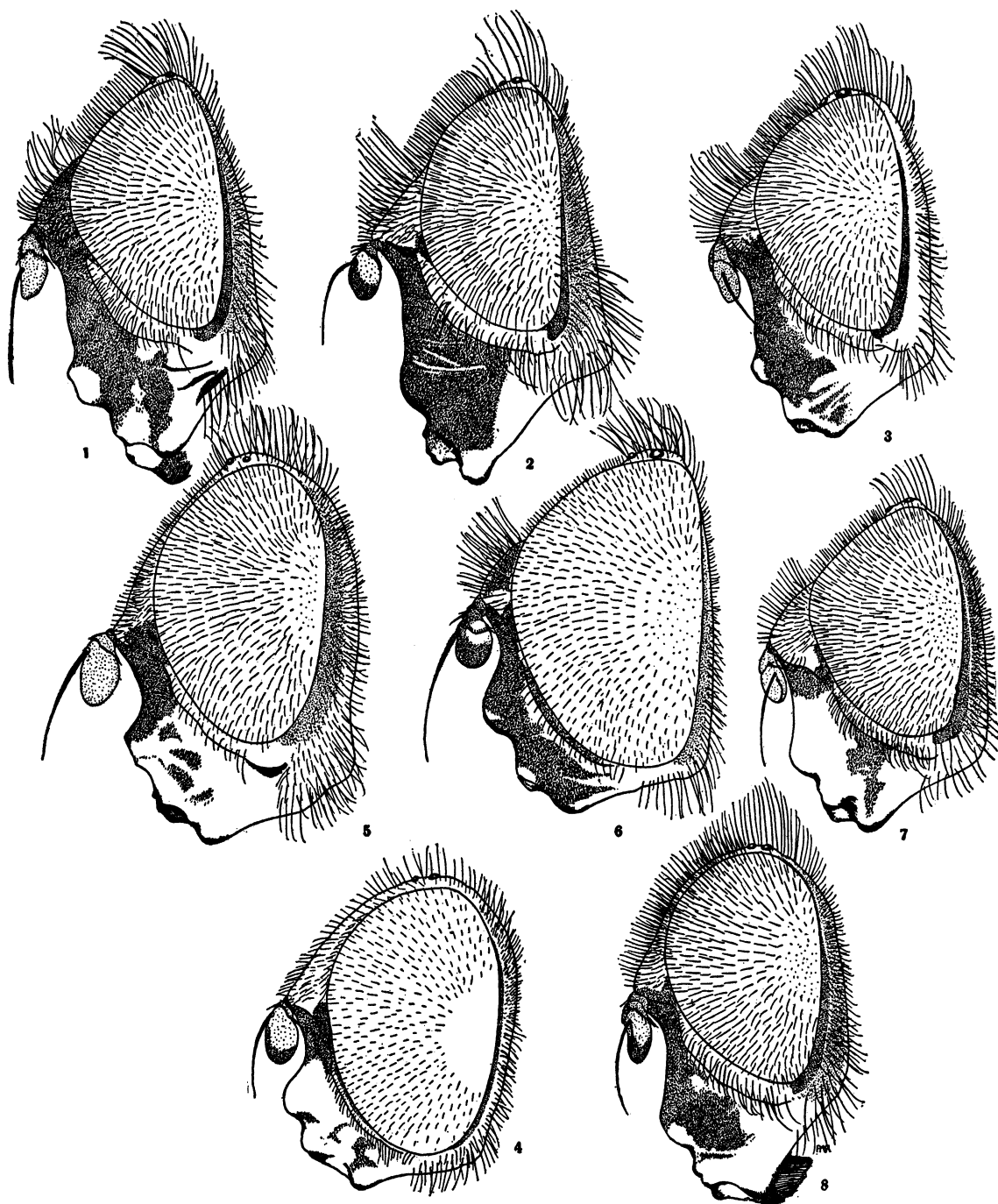
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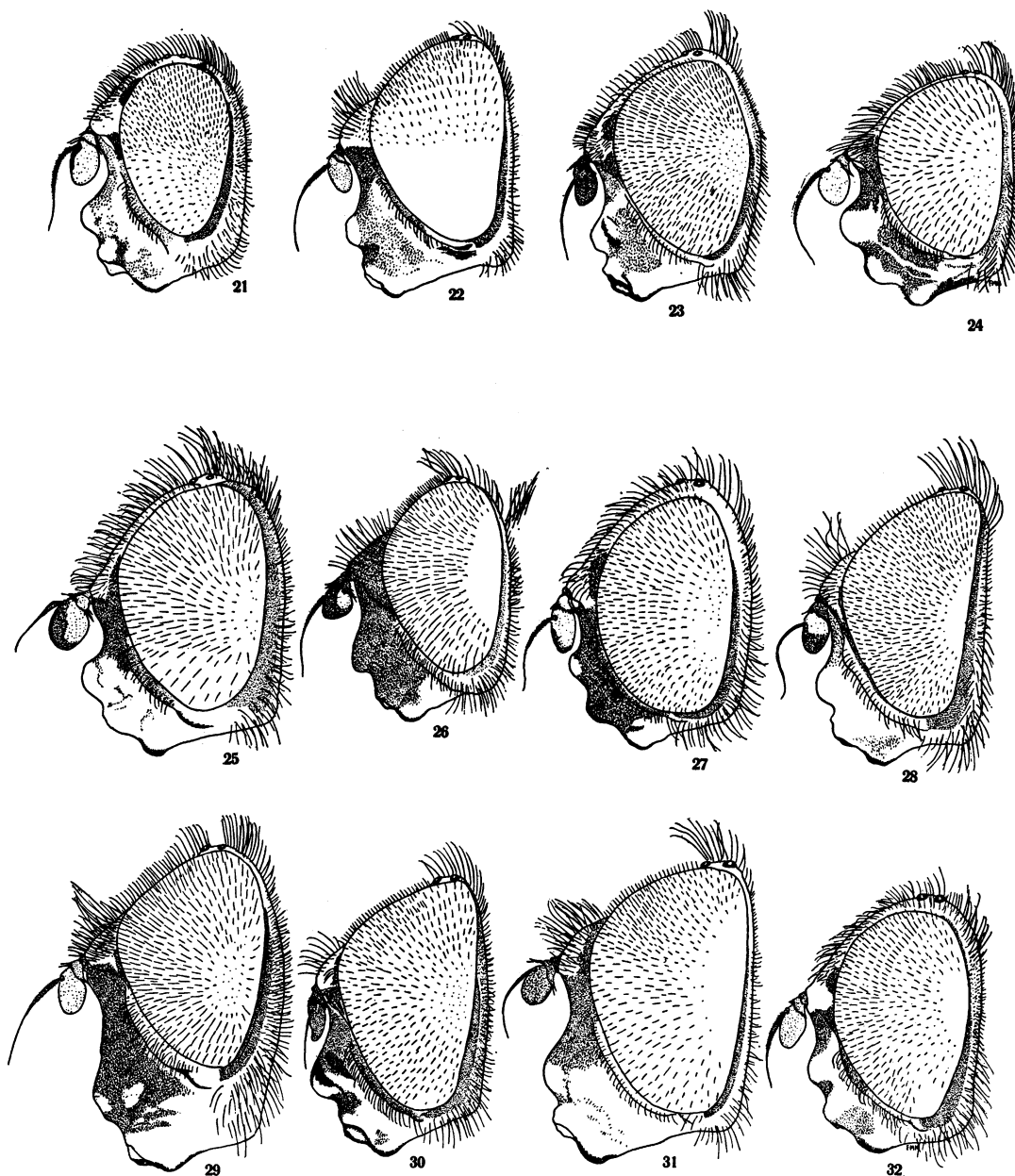
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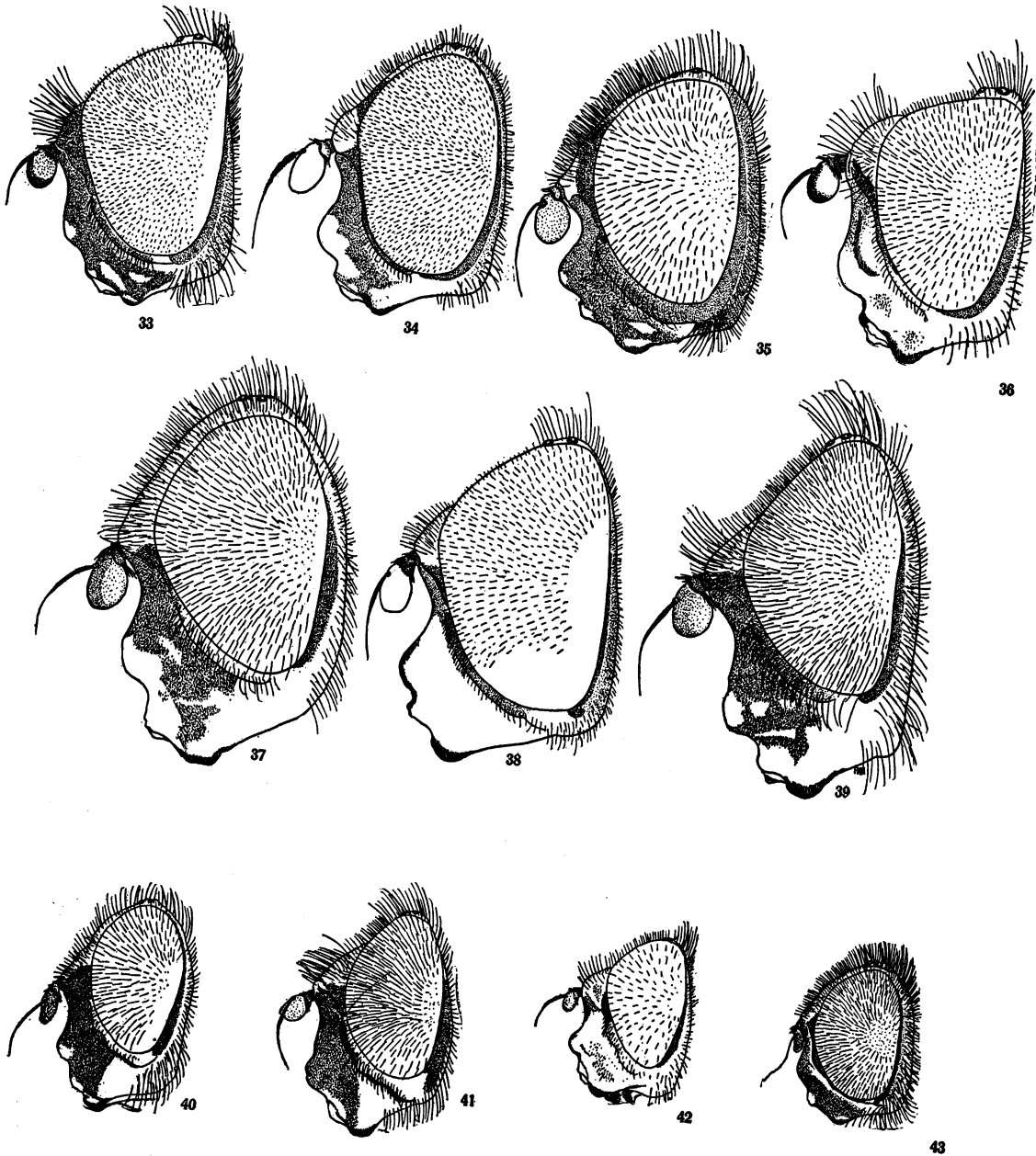
FIGS. 1-8. Heads of *Cheilosia* species. 1. *seripila*, new species, holotype male. 2. *ferruginea* Lovett, male. 3. *browni* Curran, paratype male. 4. *angelica* Telford, paratype female. 5. *nigrobarba*, new species, holotype female. 6. *minnesotensis* Telford, paratype male. 7. *atrocapilla*, new species, holotype male. 8. *seripila*, new species, allotype female.



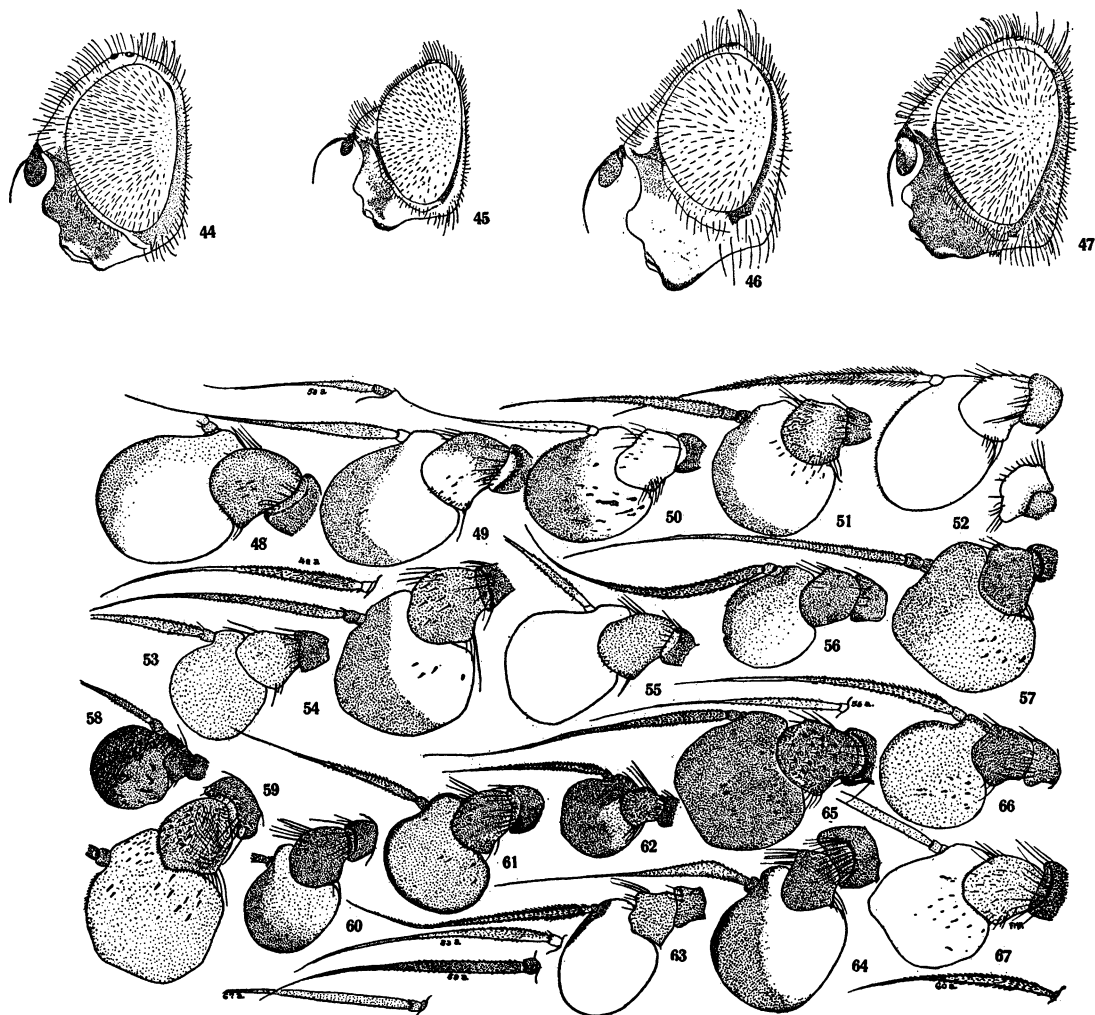
FIGS. 9-20. Heads of *Cheilosia* species. 9. *hiantha*, new species, holotype male. 10. *rhinoprosopa*, new species, holotype male. 11. *pluto*, new species, allotype female. 12. *speculum*, new species, holotype male. 13. *hiantha*, new species, allotype female. 14. *promethea*, new species, holotype female. 15. *meganosa*, new species, holotype female. 16. *hermiona*, new species, allotype female. 17. *flavosericea*, new species, holotype male. 18. *cratorrhina*, new species, holotype female. 19. *scilla*, new species, holotype female. 20. *columbiae* Curran, homotype female.



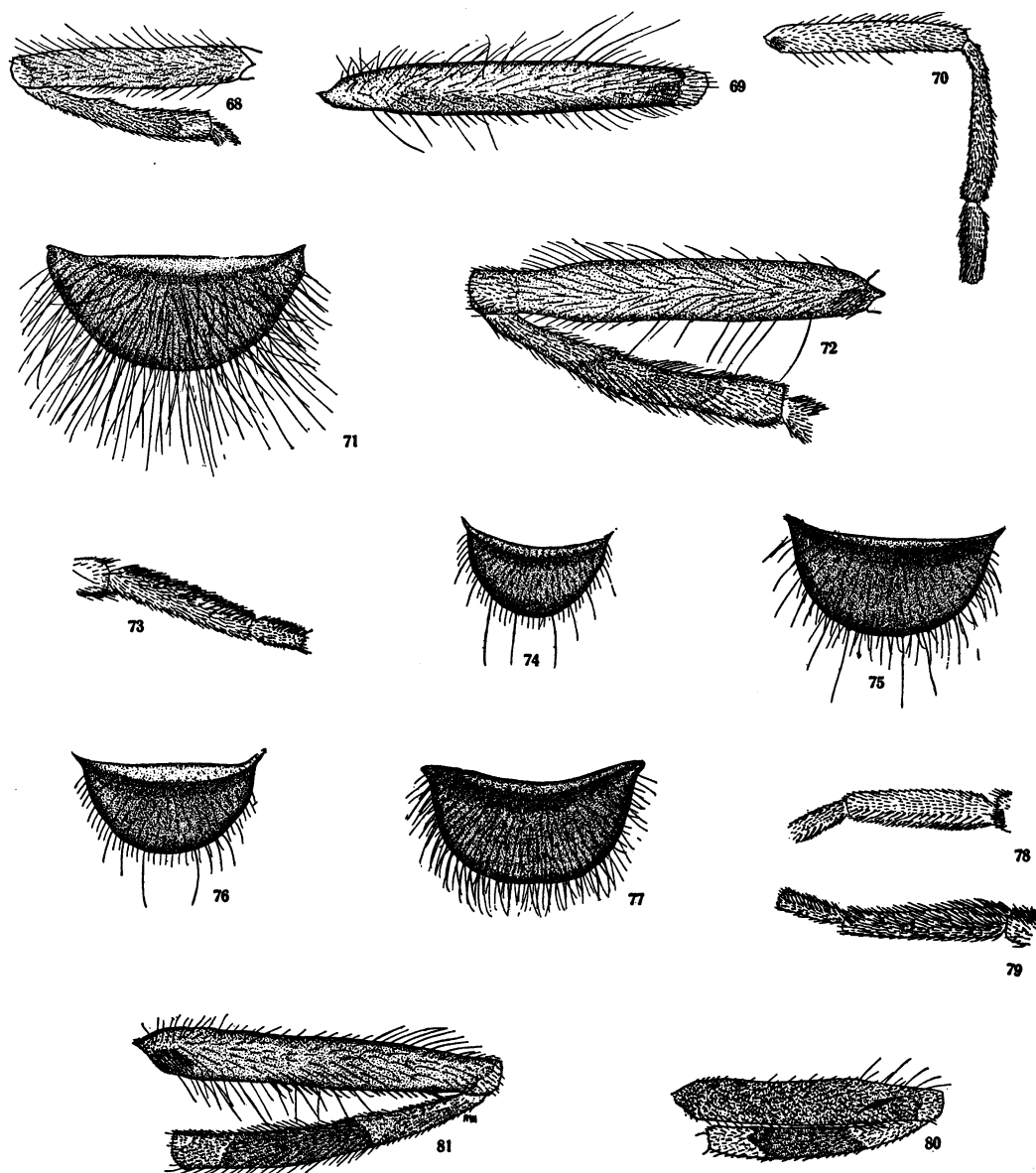
FIGS. 21-32. Heads of *Cheilosia* and *Chilomyia* species. 21. *Cheilosia subchalybea* Curran, paratype female. 22. *hunteri* Curran, homotype male. 23. *nigrescens*, new species, holotype female. 24. *sororia* Williston, type female. 25. *Chilomyia livida* Wehr variety, female. 26. *Cheilosia montanipes*, new species, holotype male. 27. *orilliaensis* Curran, paratype female. 28. *columbiae* Curran, homotype male. 29. *nigroapicata* Curran, paratype male. 30. *cynoprosopea*, new species, holotype male. 31. *nigrofasciata* Curran, paratype male. 32. *nokomis*, new species, holotype female.



FIGS. 33-43. Heads of *Cheilosia* species. 33. *margarita*, new species, holotype male. 34. *catalina* Shannon, holotype female. 35. *chrysochlamys* Williston, paratype female. 36. *alaskensis flavipennis*, new subspecies, holotype male. 37. *robusta* Hine, paratype female. 38. *cottrelli* Telford, holotype male. 39. *robusta* Hine, paratype male. 40. *bicolorata* Shannon, holotype female. 41. *lasiophthalmus* Williston, type male. 42. *florella* Shannon, holotype male. 43. *baroni* Williston, type female.

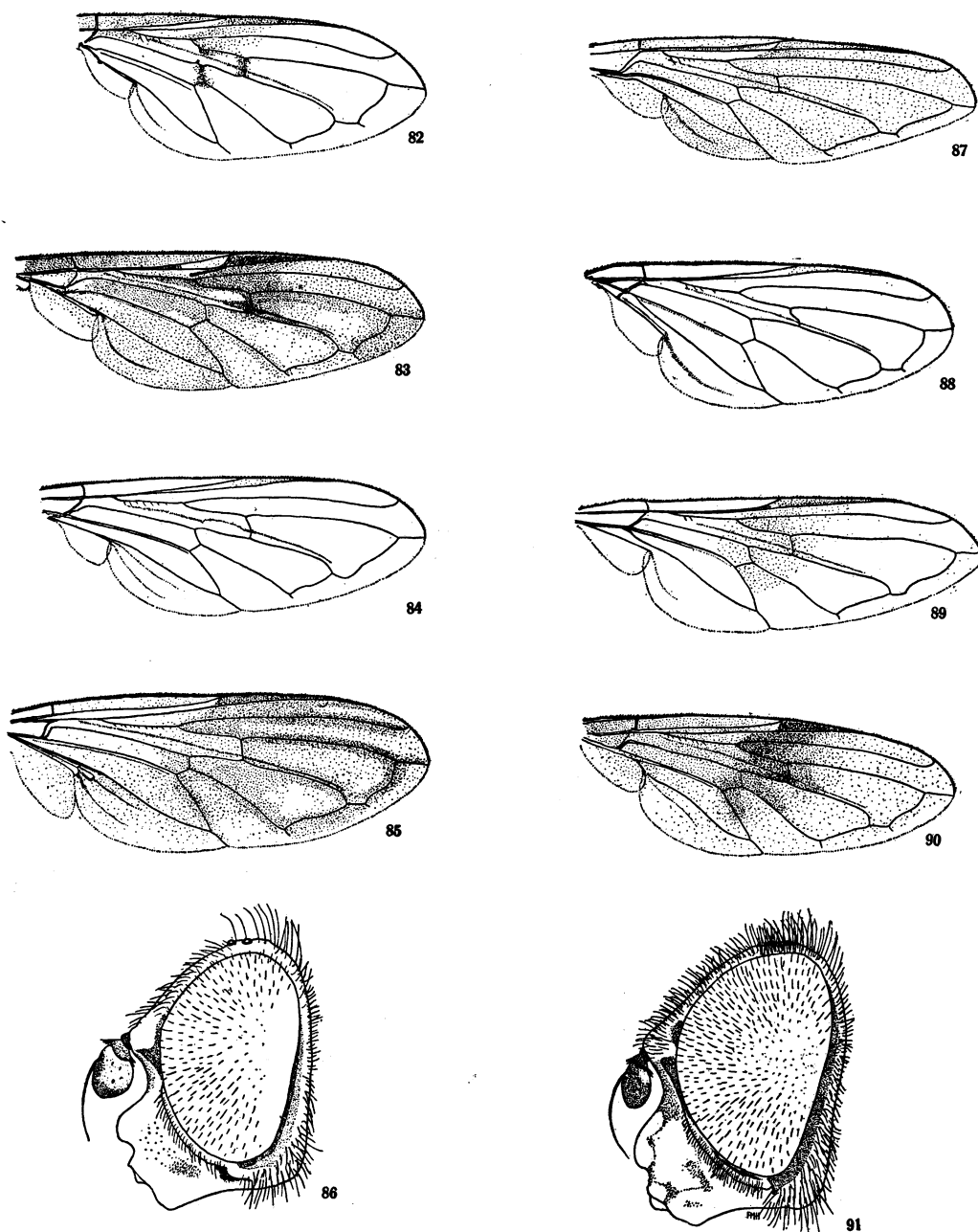


FIGS. 44-67. Heads and antennae of *Cheilosia* and *Chilomyia* species. 44. *Cheilosia nannomorpha*, new species, head, holotype female. 45. *borealis* Coquillett, head, type male. 46. *julietta* Shannon, head, holotype female. 47. *luna*, new species, head, holotype female. 48. *angelica* Telford, antenna, paratype female. 49. *minnesotensis* Telford, antenna, paratype male. 50. *tantalus*, new species, antenna, holotype female. 51. *hermiona*, new species, antenna, holotype male. 52. *catalina* Shannon, antenna, holotype female. 53. *hunteri* Curran, antenna, homotype female. 54. *robusta* Hine, antenna, paratype male. 55. *cottrelli* Telford, antenna, holotype male. 56. *alaskensis flavipennis*, new variety, antenna, male. 57. *browni* Curran, antenna, paratype male. 58. *meganosa*, new species, antenna, holotype female. 59. *seripila*, new species, antenna, holotype male. 60. *columbiae* Curran, antenna, homotype male. 61. *scilla*, new species, antenna, holotype female. 62. *montanipes*, new species, antenna, holotype male. 63. *subchalybea* Curran, antenna, paratype female. 64. *Chilomyia livida* Wehr variety, antenna, female. 65. *Cheilosia rhinoprosopa*, new species, antenna, holotype female. 66. *cratorhina*, new species, antenna, holotype female. 67. *atrocapilla*, new species, antenna, holotype male.

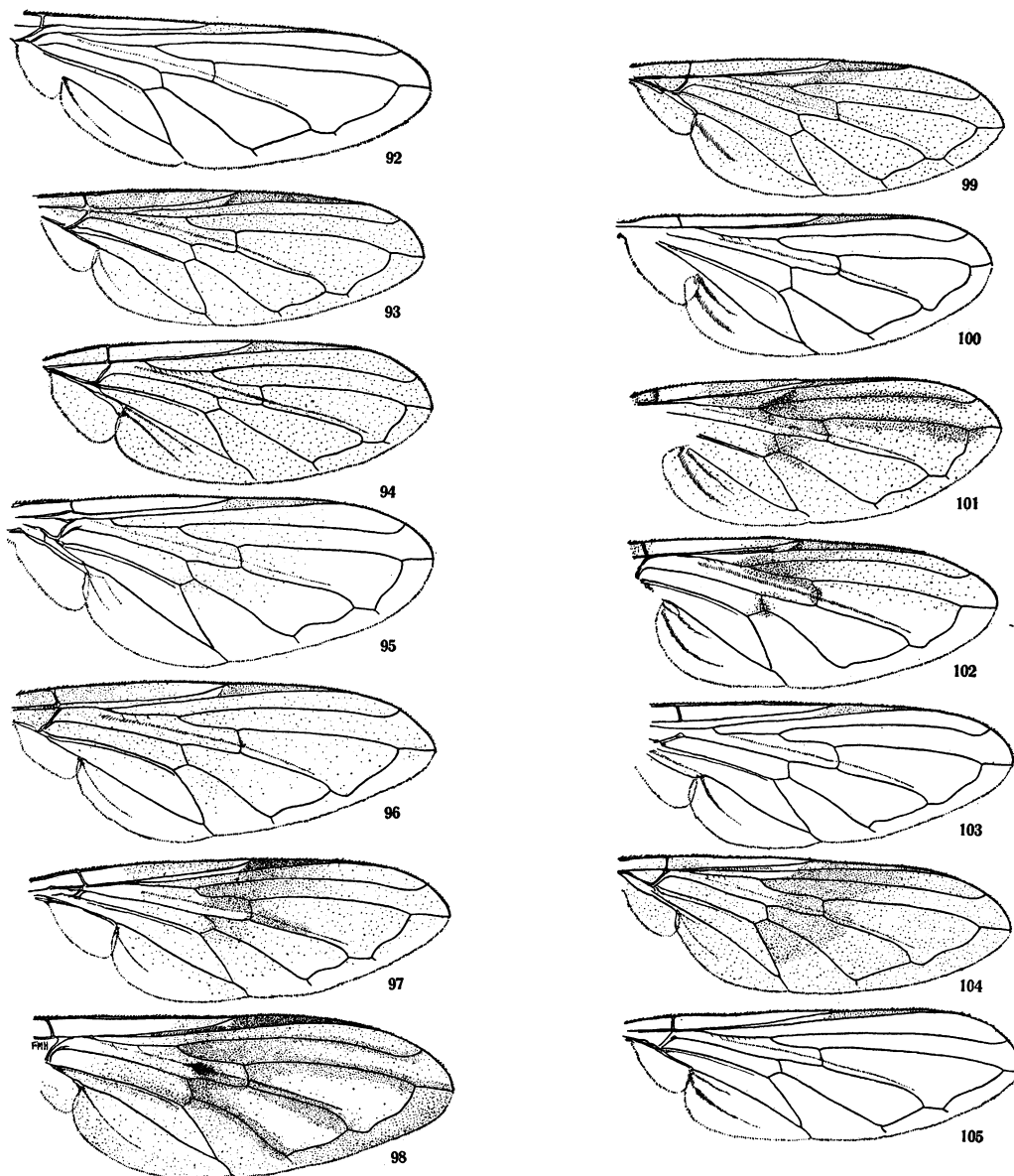


FIGS. 68-81. Parts of thorax and legs of *Cheilosia* species. 68. *flavosericea*, new species, hind femur and tibia, holotype male. 69. *robusta* Hine, hind femur, paratype male. 70. *nannomorpha*, new species, hind femur and tibia, holotype female. 71. *nigroapicata* Curran, scutellum, paratype male. 72. *browni* Curran, hind femur and tibia, paratype male. 73. *angelica* Telford, hind basitarsus, paratype female. 74. *luna*, new species, scutellum, holotype female. 75. *nigrofasciata* Curran, scutellum, paratype male. 76. *subchalybea* Curran, scutellum, paratype female. 77. *hiantha*, new species, scutellum, allotype female. 78. *meganosa*, new species, hind basitarsus, holotype female. 79. *minnesotensis* Telford, hind basitarsus, paratype male. 80. *nigrofasciata* Curran, hind femur and tibia, paratype male. 81. *minnesotensis* Telford, hind femur and tibia, paratype male.

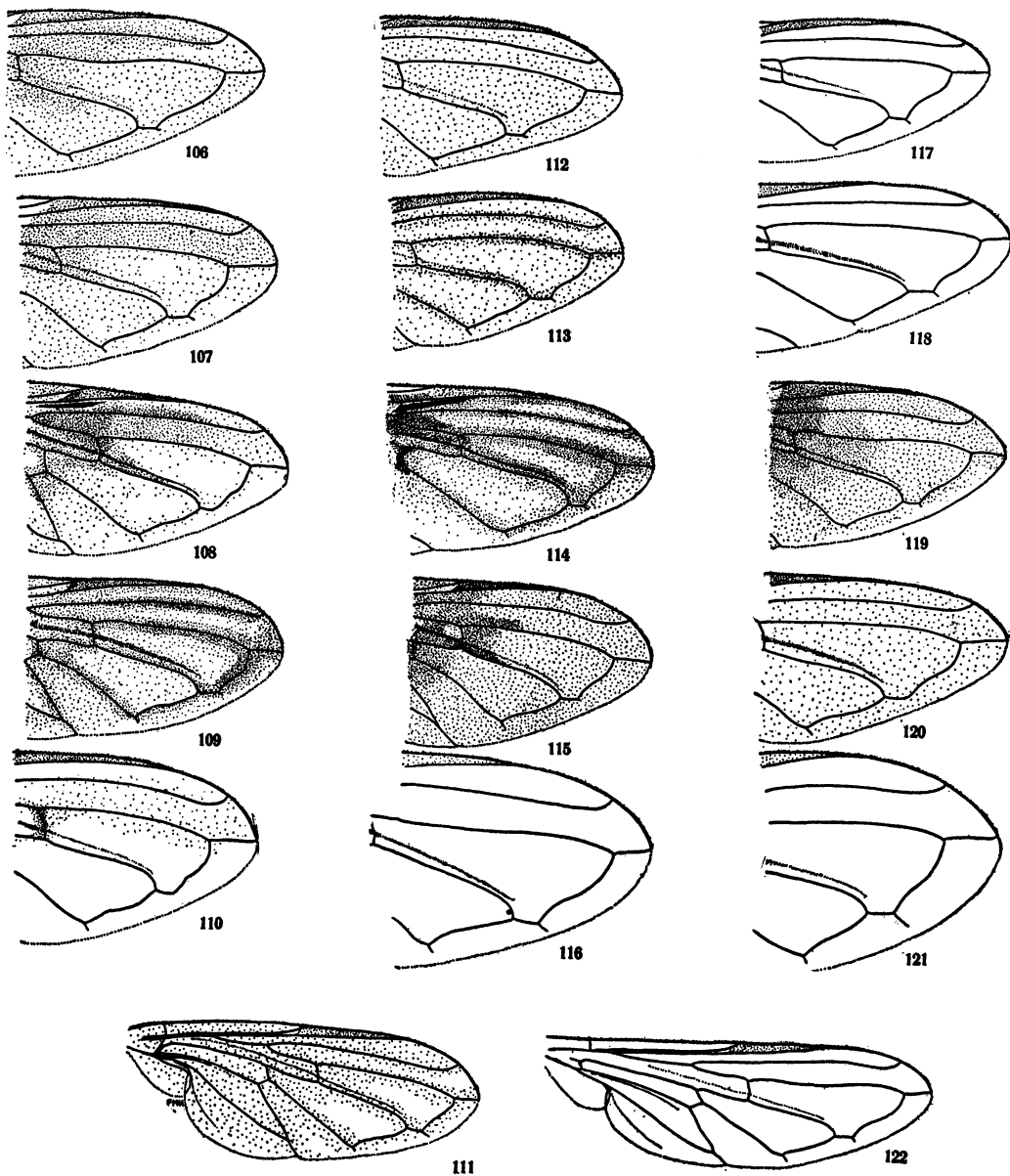




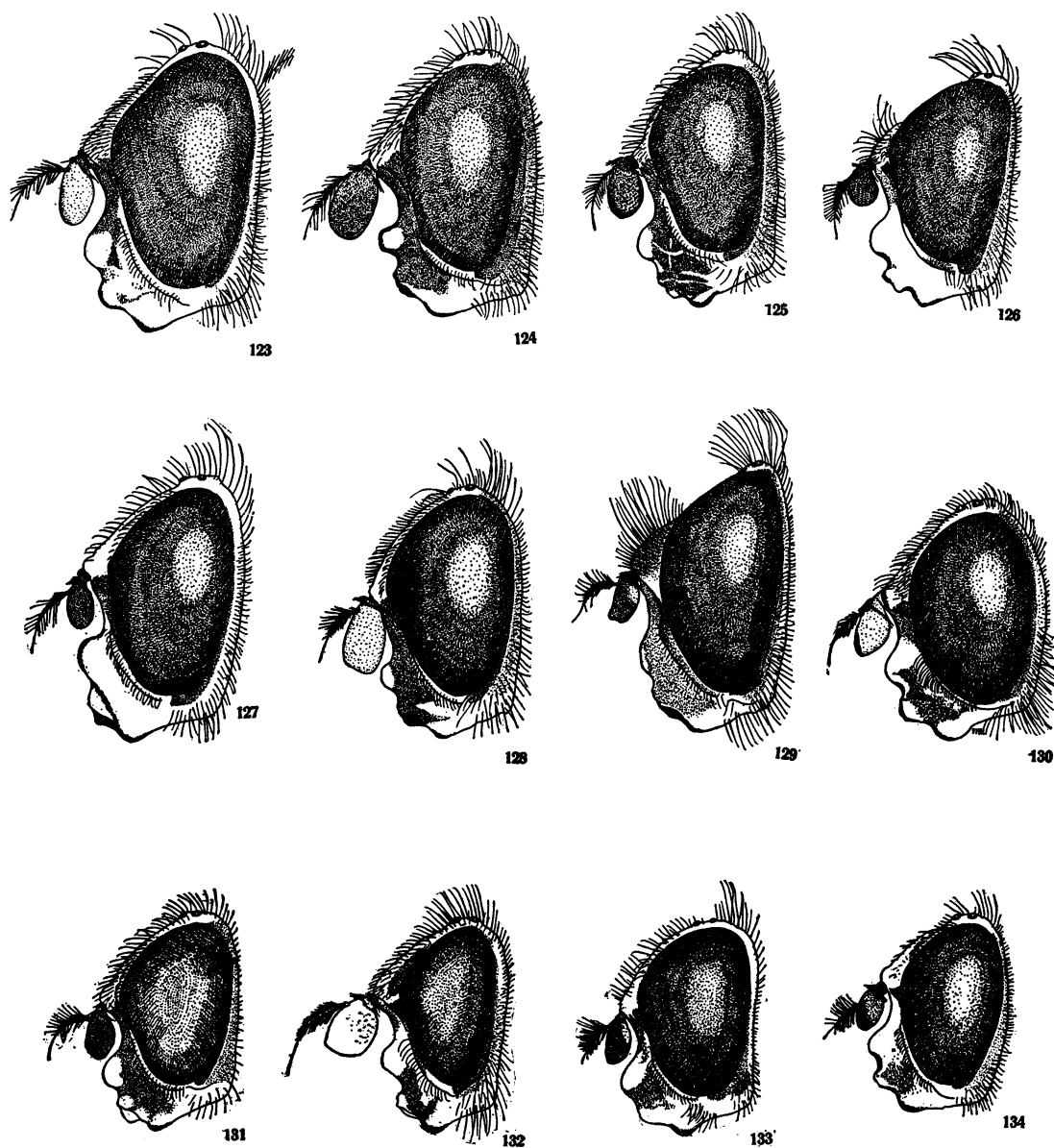
FIGS. 82-91. Wings and heads of *Cheilosia* and *Hiatomyia* species. 82. *Cheilosia porcina*, new species, wing, holotype female. 83. *atrocapilla*, new species, wing, holotype male. 84. *Hiatomyia olivia*, new species, wing, holotype male. 85. *Cheilosia pluto*, new species, wing, allotype female. 86. *tantalus*, new species, head, holotype female. 87. *alaskensis flavipennis*, new subspecies, wing, holotype male. 88. *promethea*, new species, wing, holotype female. 89. *speculum*, new species, wing, holotype male. 90. *hermiona*, new species, wing, holotype male. 91. *porcina*, new species, head, holotype female.



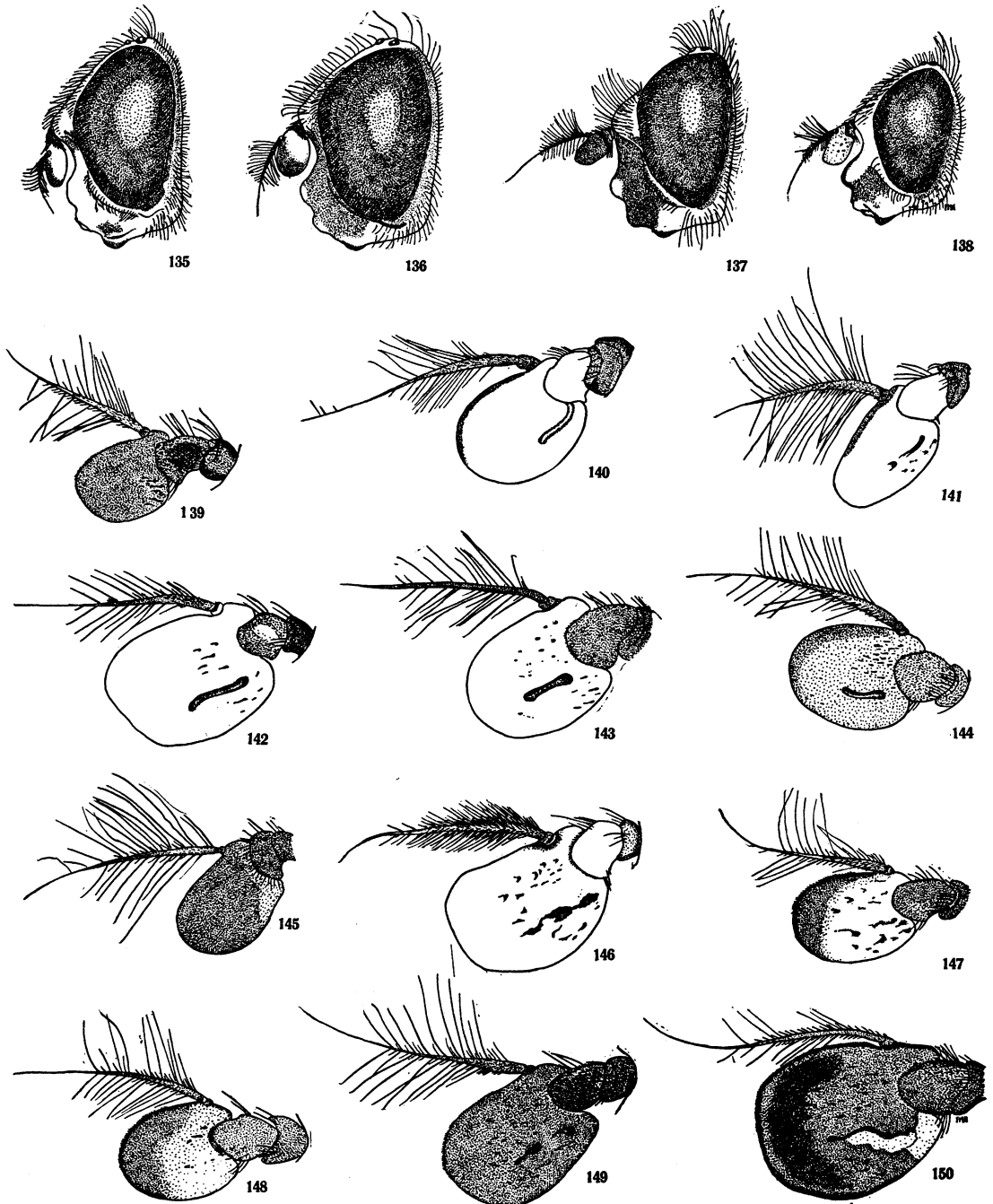
FIGS. 92-105. Wings of *Cheilosia* and *Chilomyia* species. 92. *Cheilosia montanipes*, new species, holotype male. 93. *nigrofasciata* Curran, paratype male. 94. *cratorhina*, new species, holotype female. 95. *meganosa*, new species, holotype female. 96. *cottrelli* Telford, holotype male. 97. *nigroapicata* Curran, paratype male. 98. *rhinoprosopa*, new species, holotype male. 99. *scilla*, new species, holotype female. 100. *Chilomyia livida* Wehr variety, female. 101. *Cheilosia hiantha*, new species, allotype female. 102. *hiantha*, new species, holotype male. 103. *robusta* Hine, paratype male. 104. *cynoprosopa*, new species, holotype male. 105. *catalina* Shannon, holotype female.



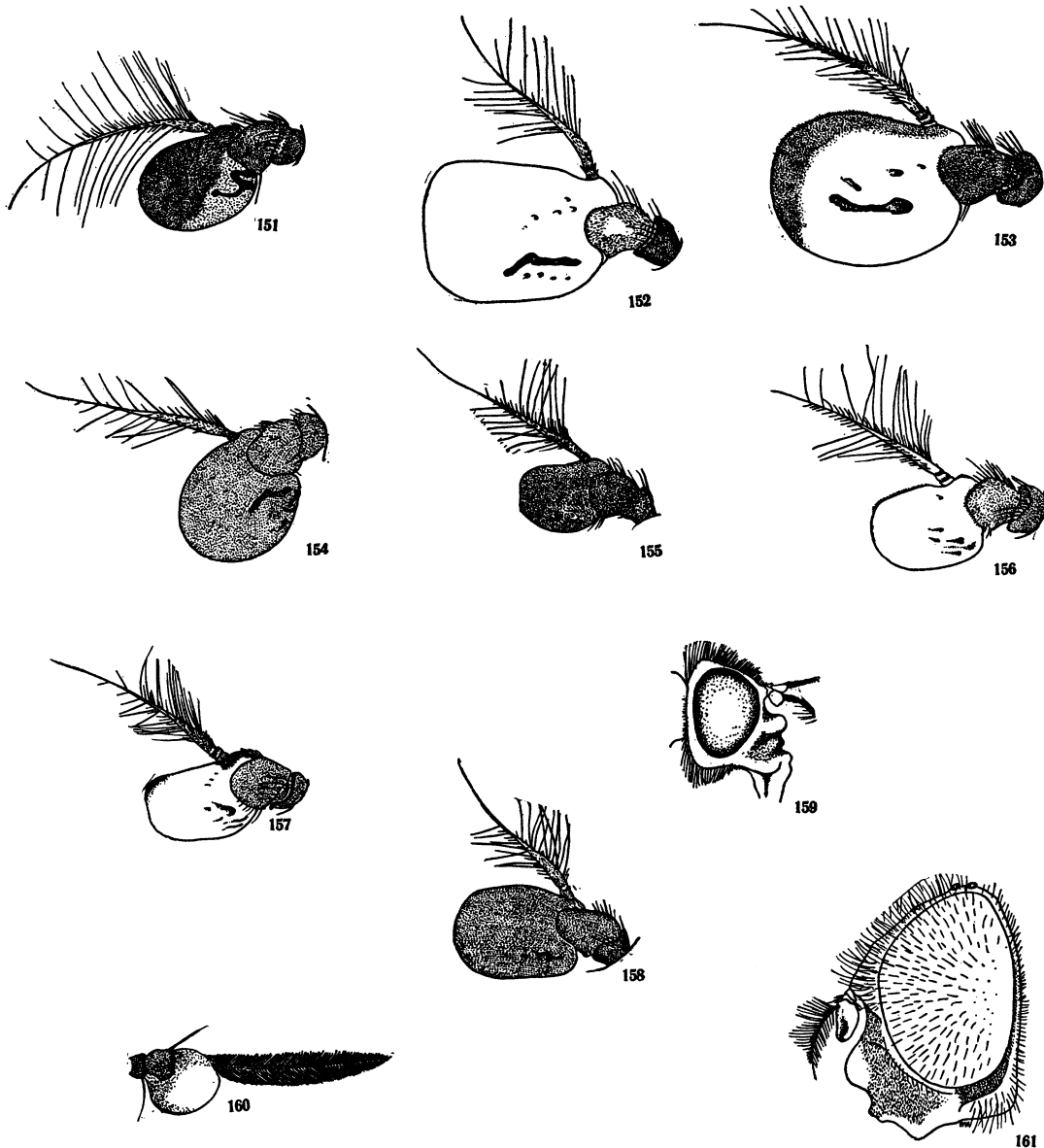
FIGS. 106-122. Wings of *Cheilisia* species. 106. *minnesotensis* Telford, paratype male. 107. *browni* Curran, paratype male. 108. *robusta* Hine, paratype female. 109. *pluto*, new species, holotype female. 110. *nigrobarba*, new species, holotype male. 111. *tantalus*, new species, holotype female. 112. *ferruginea* Lovett, male. 113. *ferruginea* Lovett, female. 114. *seripila*, new species, allotype female. 115. *hermiona*, new species, paratype female. 116. *nannomorpha*, new species, holotype female. 117. *hirsuta*, new species, holotype male. 118. *hirsuta*, new species, allotype female. 119. *angelica* Telford, paratype female. 120. *seripila*, new species, holotype male. 121. *luna*, new species, holotype female. 122. *flavosericea*, new species, holotype male.



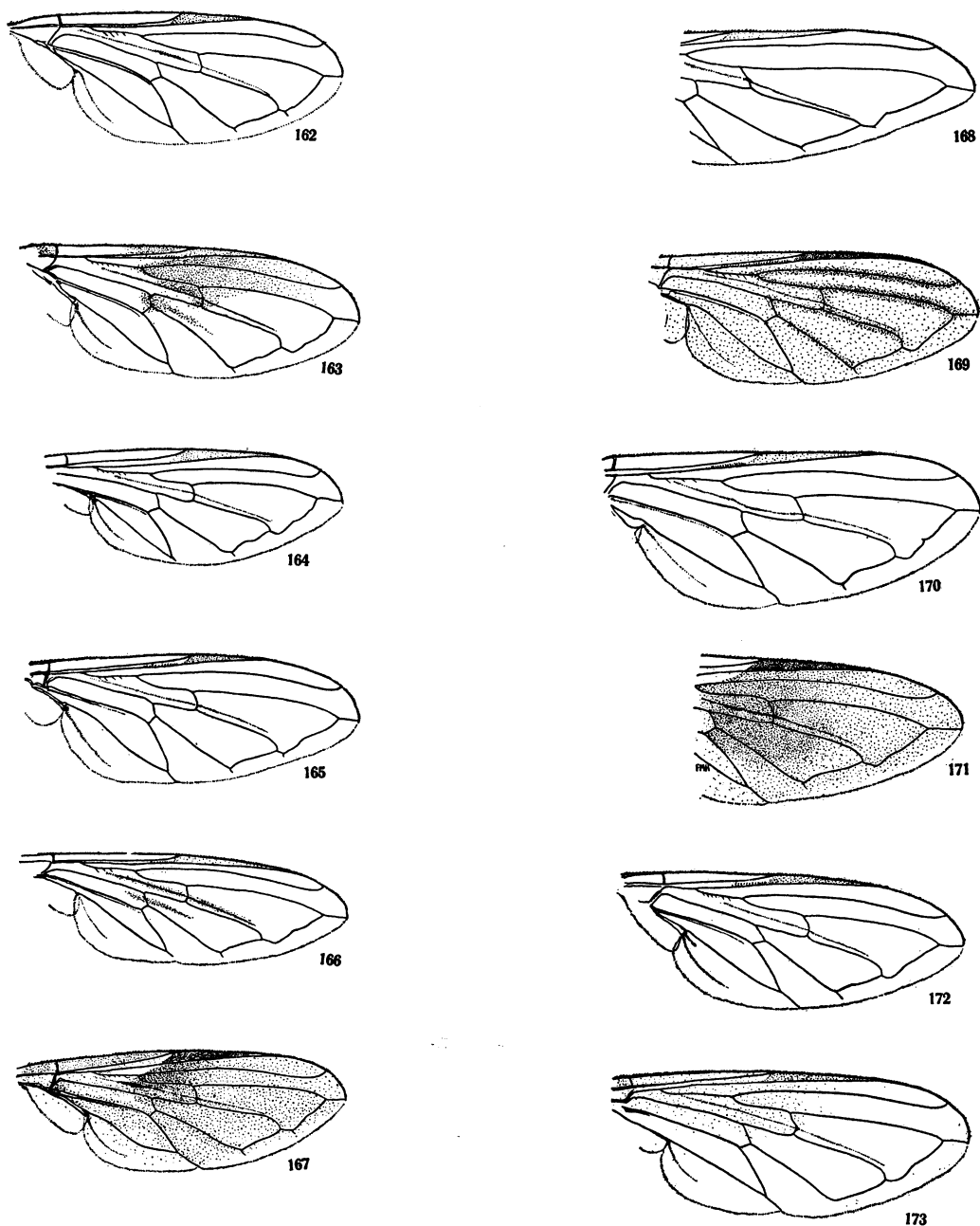
FIGS. 123-134. Heads of *Hiatomyia* species. 123. *rubroflava*, new species, holotype female. 124. *nasica*, new species, holotype female. 125. *chionthrix*, new species, holotype female. 126. *tessa*, new species, holotype male. 127. *tessa*, new species, allotype female. 128. *coriacea*, new species, holotype female. 129. *olivia*, new species, holotype female. 130. *hecate*, new species, holotype female. 131. *nigrocyanea*, new species, holotype female. 132. *signatiseta* Hunter, female. 133. *idahoae eunicea*, new variety, holotype female. 134. *nyctichroma*, new species, holotype female.



FIGS. 135-150. Heads and antennae of *Hiatomyia* species. 135. *chrysothrix*, new species, head, holotype female. 136. *hyacintha*, new species, head, holotype female. 137. *idaho* Shannon, head, holotype male. 138. *plumosa* Coquillett, head, type female. 139. *gemini* Shannon, antenna, male. 140. *hecate*, new species, antenna, holotype female. 141. *townsendi* Hunter, antenna, female. 142. *coriacea*, new species, antenna, holotype female. 143. *rubroflava*, new species, antenna, holotype female. 144. *chionthrix*, new species, antenna, holotype female. 145. *hyacintha*, new species, outer surface view of antenna, holotype female. 146. *signatiseta* Hunter, antenna, female. 147. *chrysothrix*, new species, antenna, holotype female. 148. *nyctichroma*, new species, antenna, holotype female. 149. *willistoni* Snow, antenna, holotype female. 150. *nasica*, new species, antenna, holotype female.



FIGS. 151-161. Heads and antennae of *Hiatomyia*, *Taeniochilosia*, and *Endoiasimyia* species. 151. *Hiatomyia idaho eunicea*, new subspecies, antenna, holotype female. 152. *coriacea*, new species, antenna, female. 153. *coriacea*, new species, antenna, female. 154. *tessa*, new species, antenna, allotype female. 155. *tessa*, new species, antenna, holotype male. 156. *cyanea* Hunter, antenna, male. 157. *canadensis* Shannon, antenna, male. 158. *nigrocyanea*, new species, antenna, holotype female. 159. *Taeniochilosia atriseta* Oldenberg, head, female (redrawn from original). 160. *atriqueta* Oldenberg, antenna, female (redrawn from original). 161. *Endoiasimyia indiana* Bigot, head, type female.



FIGS. 162–173. Wings of *Hiatomyia* species. 162. *nyctichroma*, new species, holotype female. 163. *tessa*, new species, allotype female. 164. *hecate*, new species, holotype female. 165. *chionthrix*, new species, holotype. 166. *tessa*, new species, holotype male. 167. *chrysothrix*, new species, holotype female. 168. *cyanescens* Loew, male. 169. *nasica*, new species, holotype female. 170. *coriacea*, new species, holotype female. 171. *cyanea* Hunter, male. 172. *nigrocyanea*, new species, holotype female. 173. *rubroflava*, new species, holotype female.



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