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SOME OLD AND NEW SPECIES OF MUSCINAE FROM THE ETHIOPIAN REGION (DIPTERA, MUSCIDAE)

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A review of the African species of the genus *Orthellia* Robineau-Desvoidy and the description of a new species of *Musca* Linné and *Aethiopomyia* Malloch are included in the following pages. Special emphasis has been placed upon the West African species of *Orthellia* since more individual specimens, personally collected, were available for study and because this area appears to have been less well studied than other regions in Africa.

Thanks to the kind and generous help of Mr. J. E. Collin of Newmarket, England, and Dr. F. van Emden of the Commonwealth Institute of Entomology in London several older names have been found for some of the species included in Malloch's (1923) and Curran's (1935b) papers on *Orthellia*. Both gentlemen have graciously compared specimens sent to them with Bigot's and Walker's types in England and provided valuable notes on these species. To Dr. van Emden I am deeply grateful for the loan of specimens of several species known to me only from the literature, and for the opportunity to include the description of a new species of *Orthellia* from the collection of the Commonwealth Institute of Entomology. The authorities of the United States National Museum kindly permitted the loan of the African species of *Orthellia* in the museum collection. To Dr. C. W. Sabrosky I owe many thanks for graciously giving of his time and efforts in making specimens available and obtaining copies of several references not otherwise available to me.

Last, but by no means least, it is my privilege again to thank Dr. C. H. Curran of the American Museum of Natural History for his generosity and kindness in lending their collection of *Orthellia*,

including the types of his several species, and for submitting the new species of *Aethiopomyia*.

Without the cooperation of these gentlemen completion of this study would have been most difficult or impossible.

Unless otherwise stated, the holotypes of all new species are deposited in the American Museum of Natural History.

***Musca (Biomyia) liberia*, new species**

MALE: Length, 4.5–5.5 mm. Head black, grayish pruinulent. Front along almost its entire length about 1.5 times as wide as diameter of anterior ocellus. The parafrontals contiguous along most of their length. In profile, parafacials and parafrontals scarcely visible. Cheeks 1.5 times as high as width of third antennal segment. Viewed from in front, the parafacials 0.5 to 0.6 times as wide as width of third antennal segment. Parafrontal setulae short; somewhat longer anteriorly and becoming gradually shorter posteriorly and continued to opposite the ocellar tubercle. Anterior ocellar bristles short but distinct and obviously differentiated from the short clothing setulae; inner vertical bristles long and strong, subequal to the vibrissae. Third antennal segment about three times as long as the second. The antennae inserted opposite the lower 0.4 of eyes. Longest arisal hairs as long as the length of third antennal segment. Palpi and proboscis black, normal, grayish pruinulent. Eyes entirely bare.

Thorax black, subshiny, with only sparse grayish pruinescence when viewed from in front; when viewed from above and behind, with an area of dense whitish pruinescence in center of the pre-sutural area and with another over the humeri and extending posteriorly to the transverse suture, the remainder of thorax appears almost entirely black and with only very sparse pruinescence. At no angle of vision are there distinct thoracic vittae distinguishable. Acrosticals 0:1; dorsocentrals 2:2, but frequently, especially in larger specimens, with two to three pairs of short, additional, anterior postsutural dorsocentral setulae. Pra short; with setulae adjacent to the base of both notopleural bristles. Scutellar clothing setulae extending to but not onto ventral surface except possibly at extreme base. Propleura and entire suprasquamal ridge bare. Sternopleurals 1:2. Flap-like covering of hairs of anterior thoracic spiracle yellowish white.

Legs black. Fore femora normal. Fore tibiae with a well-

developed but rather short submedian posterior to posteroventral bristle. Mid femora with a few short anteroventral and posteroventral bristles on basal one-half. Mid tibiae with five to six posterior bristles of irregular length and without bristles on other surfaces except at apex. Hind femora with two or three well-developed apical anteroventral bristles and with two or three shorter basal anteroventral and posteroventral ones; with the usual anterodorsal row. Hind tibiae with very short bristles, two to three anterodorsals, and one anteroventral and posteroventral; basad of the anterodorsal bristles there are sometimes a few shorter upstanding setulae which are continued to base.

Wings hyaline, becoming yellowish anteriorly. Stem vein with one or two setulae on upper surface basad of the humeral cross vein; other veins except costa bare. First posterior cell narrowly open. Calyptrae and halteres yellow.

Abdomen shiny transparent yellow except at extreme base of first visible tergite and the entire fourth visible tergite, which are brownish black, the latter with yellowish gray pruinescence. Occasionally post-mortem decay of the viscera causes the abdomen to appear more extensively darkened, especially towards apex and along the mid-line.

FEMALE: Length, 5–6 mm. Similar to the male, colored as in the male; the front at vertex is 0.25 of greatest head width and almost parallel sided. Frontal stripe sparsely grayish pollinose. Parafrontal bristles more well developed than in the male and with the anterior bristle in this series, the anterior ocellars and inner and outer vertical bristles well developed but somewhat shorter than the vibrissae. In profile, the juncture of parafacials and parafrontals somewhat prominent, about 0.75 as long as width of third antennal segment. Antennae inserted opposite or slightly above middle of eye. Palpi stouter and slightly wider, especially on apical portion.

Thorax marked as in male, but with the clothing setulae somewhat longer and the presutural dorsocentral bristles shorter than in the male and less well differentiated from the setulae.

Wings more hyaline and with the yellowish area much reduced or absent.

Abdomen rather variable in color, with an extensive yellowish area as in male (allotype) or with entire basal segment and a median vitta and posterior transverse bands on second and third visible tergites darkened. The pruinosity more dense and yel-

lowish. In all cases, the yellow ground color is more dull and less transparent than in the male.

TYPE MATERIAL: Holotype, male, Robertsport, Liberia, March 7, 1943 (near village of Bendu); allotype, female, Robertsport, Liberia, December 6, 1943 (near village of Talla); paratypes, 12 males and four females, various dates in March and December, 1943, at Robertsport, Liberia, near villages of Talla and Bendu (F. M. Snyder).

This species was invariably seen in rather marshy areas in somewhat open spots near native villages, although it was never observed in strong, direct sunlight. This series was collected while they were resting on, or making short flights away from, decaying logs embedded in the mud.

I am greatly indebted to Dr. van Emden, who examined part of the type series, for pointing out that this species was apparently undescribed.

In general color and habitus this species resembles *ventrosa* Wiedemann, although the grayish thoracic pruinescence is less extensive and the parafacials are considerably narrower and it possesses a median bristle on the fore tibiae. Structurally *liberia* appears most closely allied to *conducens* Walker, to which it will trace in van Emden's key (1939, p. 79), but can be separated from that species by its larger size (4.5–6 mm. versus 3–4 mm.) and by the different markings. The following couplet will serve, I trust, to make this distinction clear:

Male: Thorax with a lateral dorsal vitta on each side which extends along entire disc and is separated into two in front of suture; remainder of disc with dense yellowish gray pollen; abdomen with a dark median stripe.

Female: Thorax as in male; abdomen entirely black in ground color
.....*conducens* Walker

Male: Without distinct lateral vittae; disc somewhat shiny, with a central and a lateral white pollinose spot presuturally when viewed from behind; remainder of thorax with sparse gray pruinescence; abdomen without a dark median vitta. *Female*: Thorax as in male; abdomen either entirely yellow in ground color except at base and apex, or with extensive yellowish areas laterally on second and third visible tergites.....
.....*liberia*, new species

AETHIOPOMYIA MALLOCH

Aethiopomyia MALLOCH, 1921, Ann. Mag. Nat. Hist., ser. 9, vol. 7, p. 426.
CURRAN, 1935, Amer. Mus. Novitates, no. 776, p. 23.

There are few, if any, structural characters in so far as I have found which will separate what have been considered to be

species within the genus *Aethiopomyia*. The species described below differs from *gigas* Stein (1906, p. 37) in having the thoracic pleura unicolorous, and in this respect agrees with *steini* Curran (1935a, p. 24). From the latter species, it is separated by its larger size and by having a darkened median thoracic vitta. *Gigas* Stein further differs from both species in having four black thoracic vittae, the tibiae considerably darker than femora, and the palpi entirely fulvous. A character that may be of some value in further separating *steini* from *williamsi* is the presence of two or more strong anteroventral apical bristles on the hind femora in *williamsi*, while in the specimen of *steini* collected in Liberia, there is but a single strong pre-apical bristle, though a few clothing setulae may be somewhat longer in this area. A longer series of *steini* will be necessary before the value of this last character can be determined.

***Aethiopomyia williamsi*, new species**

MALE: Length, 11.5–12.5 mm. Front, back of head, and lower portion of cheeks black, the remainder of head yellow to fulvous; all parts grayish to silvery pruinulent. Front at vertex 0.10 of head width, broadened to 0.15 at base of antennae. Each parafrontal at least 1.5 times as wide as distance across posterior ocelli inclusive and distinctly wider than the frontal vitta. With a row of about six strong parafrontal bristles and with a few short interspersed hairs. In profile, the head 2.5 times as high as long. Junction of parafacials and parafrontals 0.7 as long as width of third antennal segment, the former slightly narrowed below. Cheeks 1.0 to 1.25 times as high as greatest width of third antennal segment. Antennae fulvous, inserted opposite middle of eyes; the third segment 3.5 times as long as second. Longest arisal hairs on both surfaces together 0.8 times as long as length of third antennal segment. Palpi brownish to black. Eyes bare, or with scarcely distinguishable minute hairs.

Thorax brownish yellow, viewed from in front with a black median vitta which is overlain with grayish pruinoscence and with a narrow yellow pruinulent line adjacent to the plane of dorso-central bristles. Acrosticals 0:1; dorsocentrals 3:4; intralalars 2; pra short; setulae on notopleura adjacent to the base of both bristles; sternopleurals 1:2.

Legs concolorous with thorax, tarsi infuscated. Fore tibiae with two short, median, anterodorsal setulae. Mid femora with a

row of fine ventral setulae on the basal one-half and with an apical subdorsal posterodorsal and posterior bristle. Mid tibiae with two or three posterior bristles. Hind femora with four or five short, stout, somewhat thorn-like anteroventral bristles on the apical one-half and with numerous longer and more slender anteroventral and posteroventral bristles on the basal one-third, and with two or three thorn-like subapical posteroventral setulae. Hind tibiae with two anterodorsal and two to four short anteroventral setulae.

Wings yellowish hyaline, more intense anteriorly. Fourth vein slightly curved forward anteriorly. Node with a few short setulae above and below. Calyptrae and halteres fulvous brown.

Abdomen concolorous with thoracic ground color, with a dark dorsocentral vitta and a variable area similarly darkened over the apical one or two abdominal tergites. Basal sternite hairy, others with numerous long, black, ventrally directed bristles.

FEMALE: Length, 12.5–14 mm. Similar to the male. Front 0.20 to 0.25 of head width, parafrontal hairs more numerous and continued laterally to the row of bristles; third antennal segment at least 4.0 times as long as second. Hind femora with basal hairs shorter and stouter. The bristles on the abdominal sternites shorter, thorn-like, and about as long as width of the sternites where situated.

TYPE MATERIAL: Holotype, male, Diani Beach, near Mombasa, Kenya Colony (F. X. Williams); allotype, female, same data as holotype; paratypes, five males and seven females, same data as holotype.

ORTHELLIA ROBINEAU-DESVOIDY

Euphoria ROBINEAU-DESVOIDY (*nec* Burmeister, 1842), 1863, *Histoire naturelle des diptères*, vol. 2, p. 799. SÉGUY (*p.p.*), 1937, *in* Wytsman, *Genera insectorum*, fasc. 205, p. 404.

Orthellia ROBINEAU-DESVOIDY, 1863, *Histoire naturelle des diptères*, vol. 2, p. 799. MALLOCH, 1923, *Ann. Mag. Nat. Hist.*, ser. 9, vol. 12, p. 505. CURRAN, 1935, *Amer. Mus. Novitates*, no. 788, p. 4. SÉGUY, 1937, *in* Wytsman, *Genera insectorum*, fasc. 205, p. 400. VAN EMDEN, 1939, *Ruwenzori expedition 1934–5*, vol. 2, no. 3, p. 67.

Pseudopyrellia GIRSCHNER, 1893, *Berliner Ent. Zeitschr.*, vol. 28, p. 306.

Lasiopyrellia VILLENEUVE, 1913, *Rev. Zool. Afrique*, vol. 3, p. 151. TOWNSEND, 1931, *Ann. Mag. Nat. Hist.*, ser. 10, vol. 8, p. 369.

Pseudogymnosoma TOWNSEND, 1918, *Insect. Inscit. Menstr.*, vol. 6, p. 150.

Pseudorthellia TOWNSEND, 1918, *ibid.*, vol. 6, p. 44.

Stenomitra ENDERLEIN, 1934, *Zeitzugsber. Gesellsch. Naturf. Fr.*, 1933 (1934). p. 416.

Anacrostichia ENDERLEIN, 1934, *ibid.*, 1933 (1934), p. 417.

Commosia ENDERLEIN, 1934, *ibid.*, 1933 (1934), p. 421.

The limits of this genus as herein treated are the same as proposed by Malloch in the above reference and subsequently followed by Curran and van Emden. Those genera or subgenera used or proposed by Townsend, Séguay, and Enderlein are considered to be synonyms of *Orthellia*, although when the entire world fauna is included it may be desirable to use one or two of them as subgenera for the sake of convenience.

A number of key characters are used in the following table which, when used in certain combinations, appear to link related species into natural groups that might be given subgeneric names. In every case there is probably a name available in the literature that could be applied. However, I do not make use of subgeneric names in this study, since it is felt that a more complete knowledge of world fauna would be desirable.

KEY TO THE SPECIES OF *Orthellia* OF THE ETHIOPIAN REGION

1. Mesopleura with a short but distinct anterior bristle near the anterior notopleural bristle..... 16
 Mesopleura without a distinct anterior bristle..... 2
2. With three postalar bristles¹; thorax and abdomen without distinct setiferous punctures..... 3
 With two postalar bristles¹; either thorax or abdomen or both with distinct punctures which bear the clothing setulae..... 9
3. Eyes covered with numerous conspicuous hairs..... 4
 Eyes bare or at most with short, sparse hairs which are visible under high magnification only..... 6
4. With two pairs of strong presutural dorsocentral bristles.....
 *bequaerti* (Villeneuve)
 Without presutural dorsocentral bristles or with only a single hair-like pair..... 5
5. Discal cell without the usual microscopic clothing setulae on basal one-half or more; epistome distinctly projecting; palpi long and slender.....
 *cyanea* (Fabricius)
 Discal cell uniformly covered with microscopic clothing setulae; epistome not distinctly projecting; palpi shorter..... *sororella* Villeneuve
6. Epistome projecting more than the length of the antennae anteriorly; dis-

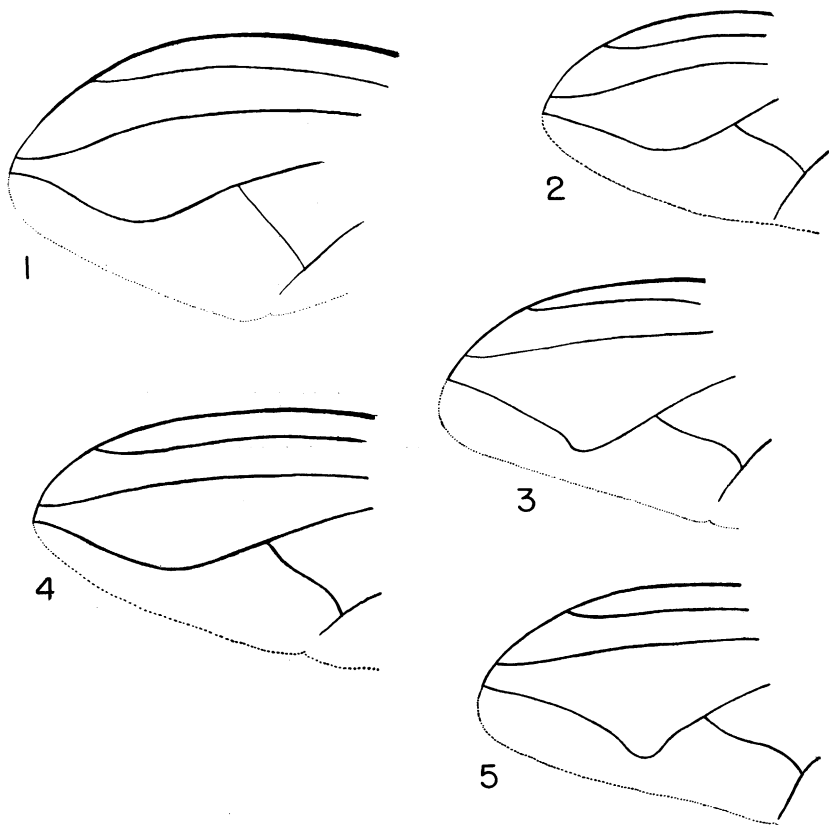
¹ In some specimens the most posterior and mesal bristle may be situated on the ridge separating the postalar declivity from the thoracic disc or somewhat over it and onto the disc; this bristle is none the less considered to be the third postalar. An occasional specimen falling into couplets 9 to 15 may have a somewhat well-developed clothing setula in the position of the third postalar, but the presence of setiferous punctures will place these specimens in their proper position.

- cal cell uniformly covered with clothing setulae.....
.....*rhingiaeformis* (Villeneuve)
- Epistome not projecting more than the antennal length anteriorly; discal cell and base of wings with large areas devoid of clothing setulae.....7
7. Dorsocentrals 2:3.....*albigena* (Stein)
- Dorsocentrals 0-1:1-2.....8
8. With a distinct inward dip in the fourth vein beyond bend; without whitish pruinescence on median declivitous presutural area of mesonotum.....
.....*dubia* Malloch
- Without a distinct inward dip in the fourth vein beyond bend; with a distinct whitish pruinescent spot on the median portion of the declivitous presutural area.....*preaes* Curran
9. Discal cell uniformly covered with clothing setulae.....
.....*semipunctata*, new species
- Discal cell without clothing setulae on the basal one-half or more.....10
10. Wings hyaline, or if with a dark spot it is basad of the humeral cross vein.....11
- Wings with the fore margin infuscated or with a series of darkened areas beyond the apex of the subcosta.....13
11. Antennae bright fulvous; parafacials and cheeks reddish brown.....
.....*rubrifacies* Malloch
- Antennae not fulvous; parafacials and cheeks blackish, brownish, or bluish.....12
12. Abdomen fulvous; occasionally with a dark median vitta.....
.....*inflata* (Townsend)
- Abdomen entirely shiny blue.....*nudissima* (Loew)
13. Abdomen fulvous.....*aurantiaca* (Villeneuve)
- Abdomen shiny blue to green.....14
14. Antennae and palpi dark brown to black.....*limbata* (Villeneuve)
- Antennae and palpi fulvous.....15
15. Coxae and femora yellow to fulvous; with a whitish pruinescent spot on median declivitous portion of mesonotum.....*trimaculata*, new species
- Coxae and femora infuscated; without a whitish pruinescent mesonotal spot.....*bimaculata* (Stein)
16. At least some portion of the discal cell largely devoid of microscopic clothing setulae.....17
- The entire discal cell uniformly covered with microscopic clothing setulae.....20
17. Without presutural dorsocentrals or with a single weak pair which are scarcely distinguishable from the clothing setulae.....*splendida* (Adams)
- With two pairs of strong presutural dorsocentral bristles.....18
18. Fourth wing vein curved forward at almost a right angle, and with a distinct inward dip beyond the bend (fig. 3).....19
- Fourth vein more gradually curved forward, the angle obtuse and without a distinct inward dip beyond the bend.....*macrops* Curran
19. Sternopleurals 1:2; antennae black. *Females*: Mid femora without a prominent submedian anterior bristle which terminates the basal row of shorter ones.....*scatophaga* Malloch
- Sternopleurals 1:3; antennae brownish to orange, especially the apex of

- second and base of third segments. *Females*: Mid femora with a prominent submedian anterior bristle terminating the basal row of shorter ones *latifrons* Malloch
20. Fourth vein curved forward at almost a right angle and with a distinct inward dip just beyond the bend (figs. 3, 5, 7) 21
Fourth vein more gradually curved forward, the angle obtuse and without a distinct dip beyond the bend (figs. 1, 2, 4) 23
21. Fore margin of wing not infuscated beyond the apex of subcosta 22
Fore margin of wing infuscated from base to apex, and the cloud extends posteriorly to the second vein or beyond, remainder of wing distinctly brownish, subhyaline *distinctipennis*, new species
22. With a median whitish pruinescent spot on anterior declivitous area of mesonotum; presutural clothing setulae long, the presutural dorsocentral bristles absent or scarcely differentiated *chrysopyga* van Emden
Without a median whitish pruinescent spot on anterior declivitous area of mesonotum; presutural clothing setulae short; with two pairs of strong presutural dorsocentral bristles *racilia* (Walker)
23. Infra-alar bulla devoid of setulae, but covered with microscopic pile; face without short setulae above oral margin between the vibrissae 24
Infra-alar bulla with several setulae on posterior portion or more; facial setulae present or absent 27
24. First wing vein with one or more setulae on the dorsal surface opposite the middle of the subcostal cell *prima* Curran¹
First wing vein without setulae on the dorsal surface opposite the middle of the subcostal cell¹ 25
25. Subcostal sclerite with numerous dark hairs over its entire surface; anterior declivitous area of mesonotum without whitish to grayish pruinescence; anterior thoracic spiracle dark. *Female*: With an elongated, highly polished black triangle which extends anteriorly at least 0.75 times the length of the front *gemma* (Bigot)
Subcostal sclerite with two or three long pale hairs on the ventral margin only; anterior declivitous area of mesonotum with white to grayish pruinescence which is most distinct on the anterior half of the humeri; anterior thoracic spiracle white. *Female*: Frontal triangle not highly polished and if slightly abraded not extending more than 0.25 times the length of front *pilarara*, new species (26)
26. Fore margin of wing without an infuscated cloud
..... *pilarara pilarara*, new subspecies
Fore margin of wing with an infuscated cloud from wing base to apex of second or third wing vein *pilarara vansomereni*, new subspecies
27. Face with one or more short but distinct setulae above oral margin and between vibrissae 30
Face nowhere with setulae 28
28. Without presutural dorsocentral bristles 29
With a single pair of presutural dorsocentral bristles ... *abnormis* Malloch

¹ Those species falling in couplets 25 and 26 as well as *prima* Curran possess one or two dorsal setulae on the first vein opposite or basad of the humeral cross vein which should not be confused with the more apically situated group in *prima* Curran.

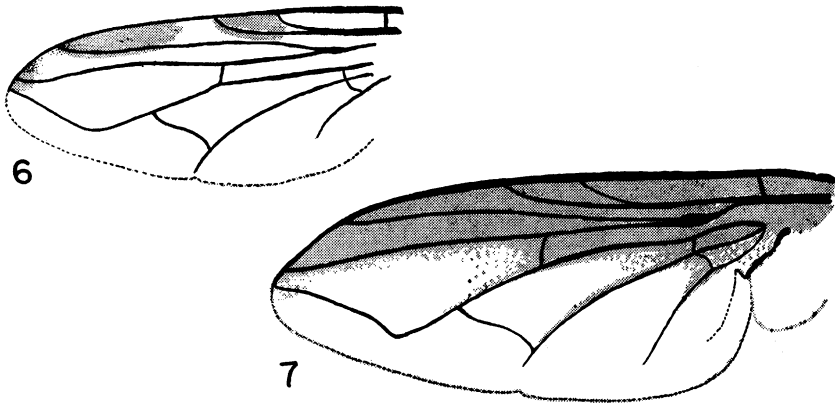
29. *Male*: With a proclinate orbital bristle. *Female*: With two strong proclinate orbitals; setulae on third wing vein not extending one-half the distance to the anterior cross vein. *orbitalis* (Stein)
Male: Without a proclinate orbital bristle. *Female*: With one strong, and with or without an additional weak proclinate, orbital bristle; setulae



FIGS. 1-5. Terminal venation of wings of *Orthellia*. 1. *O. macroviola*, new species. 2. *O. trimaculata*, new species. 3. *O. latifrons* Malloch. 4. *O. semipunctata*, new species. 5. *O. distinctipennis*, new species.

- on third wing vein extending to or beyond the anterior cross vein. *vera* Curran
 30. Fore margin of wing darkened from base to apex, and the cloud extends posteriorly to the third vein. *intacta* Curran
 Fore margin of wing not darkened, or at most with the darkened areas confined to cells basad of the humeral cross vein. 31
 31. Fourth visible abdominal tergite whitish pruinose. 32

- Fourth visible abdominal tergite shiny, not pruinulent.....33
32. The dorsal patch of longer pile on basal part of disc of lower calyptrae white. *Female*: With both calyptrae and their posterior fringes of hair entirely white. *Male*: Fourth visible abdominal tergite concolorous with the basal three segments..... *analis* Curran
- The dorsal patch of longer pile on basal part of disc of lower calyptrae brown. *Female*: With lower calyptrae dark brown to black and with a dark fringe of hairs on most of the posterior margin. *Male*: With fourth visible abdominal tergite brassy to gold, contrasting sharply with the basal three blue tergites..... *maculisquama* (Villeneuve)
33. Without presutural dorsocentral bristles.....29
- With at least one pair of strong presutural dorsocentral bristles.....34



FIGS. 6, 7. Wings of *Orthellia*, showing color pattern. 6. *O. trimaculata*, new species. 7. *O. distinctipennis*, new species.

34. The most posterior presutural dorsocentral bristle situated on a transverse level with or posterior to the posterior posthumeral bristle..... *viola* (Bigot)
- The most posterior presutural dorsocentral bristle (of one or two presutural dorsocentrals) situated on a transverse level with or anterior to the anterior posthumeral bristle.....35
35. *Female*: The ocellar bristles and the posterior reclinate parafrontal bristle shorter than the strongest one to three pairs of anterior parafrontals; with a single presutural dorsocentral bristle on each side, unless the anterior bristle on the declivitous portion of mesonotum is counted, in which case there are two..... *pura* Curran
- Female*: The ocellar bristles and the posterior reclinate parafrontal bristle long and robust, distinctly longer than the strongest one to three pairs of anterior parafrontals; with one long and one shorter presutural dorsocentral bristle on each side in addition to the anterior one on the declivitous portion of mesonotum..... *macroviola*, new species

***Orthellia bequaerti* (Villeneuve)**

Pyrellia bequaerti VILLENEUVE, 1916, Ann. Soc. Ent. France, vol. 85, p. 145.
MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 516.

Orthellia bequaerti CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 8. VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 72.

The males of this species and those of *Orthellia sororella* (Villeneuve) are very similar, having in common distinctly hairy eyes, facial setulae between vibrissae, darkened wing bases, a dip in the fourth wing vein beyond bend, the wing membrane uniformly covered with clothing setulae, and the lower calyptrae and halteres darkened. In *bequaerti* the dorsocentrals are 2:3, while in *sororella* they are 0:1-2. The epistome in *bequaerti* is not noticeably produced, but the mentum is about three times as long as high in the specimens which I have seen and would for this latter reason fall into section II of Van Emden's grouping of the species of *Orthellia*.

These notes are based on two males from Prospect and Donne, July 18 and June 12 (H. K. Munro), identified by Curran in the collection of the American Museum of Natural History.

***Orthellia sororella* Villeneuve**

Orthellia sororella VILLENEUVE, 1926, Rev. Zool. Afrique, vol. 14, p. 66.

Orthellia lasiophthalma MALLOCH, 1928, Ann. Mag. Nat. Hist., ser. 10, vol. 1, p. 473. CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 8.

Orthellia sororella VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 69.

There are a male and a female specimen from Burunga, Congo, identified as *O. cyanea* (Fabricius) by Curran, which are, I believe, identical with *O. sororella* Villeneuve. [See remarks under *O. bequaerti* (Villeneuve).]

***Orthellia cyanea* (Fabricius)**

Musca cyanea FABRICIUS, 1781, Species insectorum, vol. 2, p. 39.

Lucilia peronii ROBINEAU-DESVOIDY, 1830, Mem. Acad. Roy. Sci. France, vol. 2, p. 460.

Orthellia nigrocincta AUTHORS (*nec* Bigot) VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 71.

Orthellia cyanea MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 510. TOWNSEND, 1931, Ann. Mag. Nat. Hist., ser. 10, vol. 8, p. 369.

Orthellia peronii CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 7. VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 73.

Known to me only from one male from Donne, June 12, 1925

(H. K. Munro), determined by Curran, although I have seen specimens of *albigena* Stein and *sororella* Villeneuve identified as this species by various workers. The above specimen has an indistinct dip beyond the curve of the fourth vein, and the bend itself is similar to that in *splendida* Adams. The clothing setulae are absent from almost the entire basal one-half of the wings; the male epistome is more distinctly produced than in *albigena*, and there are several short but distinct facial setulae between the vibrissae. Strong presutural dorsocentral bristles are absent, but there are two strong and one very weak pair of postsutural ones.

***Orthellia rhingiaeformis* (Villeneuve)**

Pyrellia rhingiaeformis VILLENEUVE, 1914, Bull. Soc. Ent. France, p. 204.

Orthellia rhingiaeformis MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 507. CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 16. VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 73.

This species is easily recognized by the very greatly produced epistome. Numerous facial setulae are present near the oral margin, and there is no dip beyond the obtuse bend of the fourth vein; proclinate orbital bristles are lacking in the female. I have seen no West African specimens, but Curran has recorded it from Burunga in the Belgian Congo and I have seen several from East and South Africa.

***Orthellia prenes* Curran**

Orthellia prenes CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 15.

This species and *cyanea* are somewhat similar in general habitus, having a moderately protuberant epistome, distinct facial setulae near oral margin, no presutural dorsocentral bristles, and the basal part of the wing including parts of the discal cell devoid of clothing setulae; there is an area of obscure whitish pruinosity on the median declivitous portion of the mesonotum. The bare eyes and the wider male front will readily distinguish *prenes* from *cyanea*. I have seen only the male and female types of this species.

***Orthellia albigena* (Stein)**

Pyrellia albigena STEIN, 1913, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 11, p. 469.

Orthellia nigrocincta CURRAN (*nec* Bigot), 1935, Amer. Mus. Novitates, no. 788, p. 11.

Orthellia albigena MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 508. VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 71, fig. 5.

This species is apparently widely distributed in South and East Africa, and I have seen three males and four females from Natal, Lourenço Marques, Southern Rhodesia, and Addis Abbaba, determined by Curran and Malloch in the American Museum of Natural History and the United States National Museum.

The epistome is distinctly, though not very greatly, produced as is well illustrated by van Emden's figure. The eyes are either bare or have at most very short, scarcely distinguishable hairs. Facial setulae are present, and there is a distinct dip beyond the bend of the fourth vein. There is a patch of whitish pruinescence anteriorly on the median portion of the declivitous portion of the mesonotum. The femora are quite metallic colored though no more so than in closely allied species.

Orthellia dubia Malloch

Orthellia dubia MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 511. CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 14. VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 70.

There are a somewhat teneral male and a female of this species from Entebe, Uganda, October, 1936 (on cattle dung; E. G. Gibbons), identified by Dr. van Emden and kindly made available for study by him. The female agrees well with Malloch's description of the holotype female, and the above male is certainly conspecific with it. However, the description of Malloch's male allotype does not appear to agree with this male in that the slightly larger eye facets are not clearly separated into two areas as suggested by Malloch's remarks and as seen in certain species, e.g., *splendida* Adams and *macrops* Curran. Likewise the male has the lower calyptrae darker than the upper ones, but in the female the upper and lower calyptrae are both white. Both sexes possess a single slender pair of presutural dorsocentral bristles and a short anterior mesopleural bristle. The latter bristle, Dr. van Emden informs me, is definitely present in the female holotype.

Orthellia semipunctata, new species

MALE: Length, 6 to 9 mm. Head shiny black, in certain lights with purplish reflections; parafacials and anterior portion of para-

frontals with distinct grayish pruinosity. Back of head sparsely pruinose; the cheeks shiny. Front, face, and cheeks shaped and bristled as in *trimaculata*, new species, except the anterior para-frontal setulae are slightly longer than the longest setulae on second antennal segment. Facial setulae adjacent to oral margin absent. Antennae dark, apex of second and base of third segments dark reddish brown, the third 1.8 times as long as second. Arista yellow, the basal segment infuscated; the longest hairs 0.8 as long as the third antennal segment. Palpi brown, shaped and bristled as in *trimaculata*. The eye facets are enlarged above and in front and are not so large as in *trimaculata* nor are they sharply differentiated from the smaller lower ones.

Thorax shiny, green to bluish black, the dorsum with numerous minute punctures which bear the very short but numerous clothing setulae. The rugulae connecting the punctures much less distinct than in *nudissima* Loew. Acrosticals 0:0; dorsocentrals 2:4, the anterior three postsutural pairs shorter than the posterior pair but nevertheless well developed. Intra-alars 1; posthumeral 2; pra nearly as long as the posterior notopleural bristle; sternopleurals 1:2-3, only the posterior dorsal one long and well developed. Without an anterior mesopleural bristle and only the dorsal two to four bristles in the posterior mesopleural series well developed. Infra-alar bulla with short setulae posteriorly.

Legs black; the femora shaped as in *trimaculata*. Fore femora with a row of short but distinct posterodorsal and a row of longer posteroventral setulae. Fore tibiae without median bristles. Mid femora without well-developed bristles on any of the ventral surfaces. Mid tibiae with four to six short posterior bristles and the usual well-developed median posterior to posterodorsal bristle. Hind femora with a row of moderately long, fine, closely placed, anterodorsal bristles and with a group of six to 10 similar ones on apical half of the anteroventral surface, basad of which there are a few fine hairs that are not quite so long as femoral diameter; with a moderately long, fine, median, posteroventral setula. Hind tibiae slightly bowed, with about four slender, median, anteroventral bristles and a moderately long, fine, posterodorsal calcar.

Wings yellowish brown hyaline, the color somewhat more intense along the anterior margin; uniformly covered with the usual clothing setulae. Fourth vein as in figure 4. Setulae on third vein extending to the anterior cross vein on the dorsal surface and only part of the way on the ventral surface. Calyptrae castane-

ous, the margins slightly yellowish, the lateral juncture of upper and lower calyptrae white. Halteres orange-yellow.

Abdomen shiny bluish green, not punctate, with short black clothing hairs, those on the basal three visible tergites decumbent; those along apical margin of third and all on fourth are erect but nowhere strong.

FEMALE: Length, 7 to 9 mm. Similar to the male. The front in shape and markings similar to those of the female of *trimaculata* but much darker in ground color. Parafrontal bristles more well developed as are the anterior ocellars and both pairs of vertical bristles. Legs bristled as in the male, but the basal antero-ventral hairs on hind femora not so well developed. The apical setulae on second and third visible abdominal tergites longer and somewhat more well developed than those in the male, but those on the fourth are weaker.

TYPE MATERIAL: Holotype, male, Robertsport, Liberia, January 21, 1944; allotype, female, same data as holotype; paratypes, 38 males and seven females, topotypical, collected in January, March, October, and November of 1942 to 1944 (F. M. Snyder).

***Orthellia rubrifacies* Malloch**

Orthellia rubrifacies MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 511. CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 14.

This species and *semipunctata* appear to be closely allied, having in common very fine thoracic punctures. However, there are one or two minute facial setulae adjacent to the oral margin in *rubrifacies* which are absent in the other species. The very bright, entirely fulvous antennae and the unmarked wings should readily separate this species from any other African *Orthellia*. These notes are based upon the single female specimen in the United States National Museum determined by Malloch and bearing the same data as the holotype.

***Orthellia inflata* (Townsend)**

Pseudogymnosoma inflata TOWNSEND, 1918, Insect. Inscit. Menstr., vol. 6, p. 151.

Orthellia inflata MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 507. CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 9.

Townsend, in the original description of *Pseudogymnosoma* as

well as in the discussion of this genus in his "Manual of myology," emphasizes the presence of a dark costal cloud on the wing of the genotype, *inflata* Townsend. In the type series from Angola (United States National Museum) only one male paratype has this dark cloud and is, in my opinion, *aurantiaca* Villeneuve. The abdomen of most specimens in this series exhibits a more or less darkened central stripe which, with the possible exception of one other paratype, could be considered due to postmortem decay of the viscera. Facial setulae are absent, and the males have an area of enlarged facets above and in front. The thorax has well-defined setiferous punctures, while those on the abdomen are smaller. Acrosticals 0:0; presutural dorsocentrals minute or absent; sternopleurals 0:1. The curvature of the fourth wing vein is similar to that illustrated for *trimaculata*, new species (fig. 2). The setulae on the third wing vein are short and few. Subcostal sclerite as in *pilarara*, new species. I have seen only the type series of this species.

***Orthellia aurantiaca* (Villeneuve)**

Pyrellia nudissima aurantiaca VILLENEUVE, 1916, Ann. South African Mus., vol. 15, p. 512.

Orthellia aurantiaca MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 516. CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 9. VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 70.

Stenomitra fülleborni ENDERLEIN, 1934, Zeitzugsber. Gesellsch. Naturf. Fr., 1933 (1934), p. 417.

Through the courtesy of Dr. van Emden I have been able to study a female specimen of this species from Cholo, Nyasaland (R. C. Wood). This species appears most closely allied to *bimaculata* Stein, the females of which have in common two distinct clouds along the fore margin of the wing, the sternopleural bristles arranged 1:1, and with two pairs of short, presutural, dorsocentral setae. The antennae and palpi of *aurantiaca* are light brownish and somewhat darker than in *bimaculata* Stein. The legs are shiny dark greenish brown and the anterior pairs somewhat darker than the hind pair. The lower calyptrae are yellowish and at their lateral juncture distinctly white.

The entirely fulvous abdomen and the clouded fore margin of the wings should readily distinguish this species from related forms.

***Orthellia nudissima* (Loew)**

Pyrellia nudissima LOEW, 1852, Ber. K. Preussischen Akad. Wiss. Berlin, p. 660.

Lucilia nigrocincta BIGOT, 1858, Archiv. Ent., vol. 2, p. 368.

Pyrellia flavicalyptrata MACQUART, 1855, Diptères exotiques, suppl. 5, p. 134.

Pseudopyrellia nuda HOUGH, 1898, Proc. Acad. Nat. Sci. Philadelphia, p. 173.

Orthellia nudissima MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 506. CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 8. VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 70, fig. 4.

This species is apparently distributed throughout the African continent and is very abundant in West Africa, being taken frequently on human feces. Numerous specimens of both sexes were studied from Robertsport and Benduja, Liberia; Maiduguri, Nigeria; and Saltpond, Gold Coast.

There are minute facial setulae adjacent to the oral margin in all the specimens examined; the curvature of the fourth vein is obtuse, and the apical section beyond is straight. The upper region of male eyes has an area of slightly enlarged facets which are not nearly so large as in *bimaculata* Stein, *inflata* Townsend, and *trimaculata*, new species. The thoracic and abdominal punctures as well as the rugulae are more prominent in *nudissima* than in other species except *limbata* Villeneuve.

***Orthellia limbata* (Villeneuve)**

Pyrellia numissima limbata VILLENEUVE, 1916, Ann. South African Mus., vol. 15, p. 512.

Orthellia limbata CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 10. VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 70.

Stenomitra tessmanni ENDERLEIN, 1934, Zeitszugsber. Gesellsch. Naturf. Fr., 1933 (1934), p. 416.

This species and *nudissima* Loew are very similar in most structural characters, but the entirely darkened fore margin of the wing will readily separate it.

It also appears to be distributed throughout Africa, although it was less commonly observed in Liberia than *nudissima* and, while taken on human feces, it was usually found in deeper jungle shade.

***Orthellia bimaculata* (Stein)**

Pyrellia bimaculata STEIN, 1918, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 16, p. 187.

Orthellia bimaculata MALLOCH, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 506 [note under *O. nudissima* (Loew)], p. 516. CURRAN, 1935, Amer. Mus. Novi-

tates, no. 788, p. 9. VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 71.

There is a pair of this species from Killembé, Uganda (on human dung; F. W. Edwards), kindly lent through the courtesy of Dr. van Emden before me. The antennae and palpi are fulvous and the legs are shiny brown, distinctly darker than the antennae. In the male, the fore margin of the wing is uniformly infuscated from apex of the subcosta to tip of the fourth vein, and the base of the wing at the fore margin is slightly darker than the lighter portion of the wing but not so dark as the more apical long cloud. The female has a distinct break in the dark marginal cloud at apex of the first vein, and this marking suggests more nearly the specific name. The apical one-fifth of the fourth visible abdominal tergite is fulvous in the female, while in the male it is unicolorous blue.

***Orthellia trimaculata*, new species**

MALE: Length, 7 mm. Back of head, ocellar triangle, and posterior 0.8 of parafrontals bluish black in ground color, back of head with dense gray pollen; remainder of head reddish brown, cheeks with bluish reflections when viewed at certain angles. Front greatly narrowed for about three-quarters of its length, at its narrowest part not so wide as the greatest arisal diameter. Frontal vitta obscured along its entire length. The anterior 0.2 of parafrontals somewhat triangularly broadened, with grayish yellow pollen. Ocellar bristles not differentiated. Parafrontals with fine, scarcely discernible hairs, the most anterior ones slightly more well developed and about as long as the setulae on second antennal segment. Outer vertical bristles developed. In profile, both parafacials and parafrontals obscured; viewed from in front, parafacials at narrowest part about as wide as greatest arisal diameter, but above and below this part they are twice as wide. Facial ridges with fine, pale hairs on the ventral three-fourths. Cheeks 0.5 times as high as length of third antennal segment, or 0.15 of eye height. Without facial setulae adjacent to the oral margin. With an area of enlarged eye facets above and in front, the largest of which are almost as large as the ocelli. Antennae fulvous yellow, inserted opposite middle of eyes when viewed in profile; the third segment three times as long as second. Longest arisal hairs 0.75 as long as length of third antennal segment. Palpi concolorous with antennae, not apically broadened, and

with moderately long bristles on ventral surface. Proboscis brown, not pollinose.

Thorax shiny bluish violet, with a prominent whitish pollinose spot on median portion of the declivitous portion of mesonotum. The entire dorsal portion of thorax, including the scutellum, with scabrous punctures similar to those of *nudissima* Loew. Acrosticals 0:0; dorsocentrals hair-like, 2:1; intra-alars absent; humerals 1; postalars 2. Pra 0.75 the length of anterior notopleural bristle. Scutellum with a pair of strong apicals, a shorter basal pair, and sometimes with a pair of weak submedian laterals. Sternopleurals 1:2, the anterior one weak and hair-like. Infra-alar bulla with a few fine, pale, posterior hairs below. Anterior mesopleural bristle absent. With a single propleural bristle and without prostigmata. The pleural surfaces with rather long, fine, sparse, pale hairs. Both thoracic spiracles dark.

Coxae, trochanters, and femora yellow, the tibiae and tarsi brown. Fore femora with the posterodorsal setulae short, dark, and confined to the apical two-thirds, and with a row of somewhat lighter colored posteroventral bristles. Fore tibiae without median bristles. Mid femora slender, somewhat concave dorsally on apical one-third; with a few short, almost thorn-like ventral bristles. Mid tibiae with four short, dark, posterior bristles and a longer submedian ventral to posteroventral one. Hind femora slender, somewhat concave dorsally, with a short subapical dorsal bristle and a row of moderately short, fine, antero-dorsal bristles and with a few very short, stout, almost thorn-like anteroventral bristles on the apical one-third, and with a single dark, median, thorn-like posteroventral bristle. Hind tibiae with one to three fine, anteroventral bristles on apical one-third to one-half; other surfaces without distinguishable bristles except for the apical dorsal which is not so long as tibial diameter.

Wings hyaline but with infuscated spots as shown in figure 6. Third vein finely setulose to slightly beyond anterior cross vein on both surfaces. First vein setulose above and below only at base. Calyptrae slightly yellowish except at lateral juncture of the upper and lower ones where they are white. Halteres brownish yellow.

Abdomen concolorous with thorax, somewhat lighter colored below, and with scarbrous, setiferous punctures and without long clothing setulae but with fine, pale, short hairs.

FEMALE: Length, 7 mm. Similar to the male, differing in

having the front at narrowest part 0.30 of head width, almost parallel sided. Frontal vitta along its entire length about as wide as one parafrontal. Parafrontals with a distinct spot of silvery gray pollen opposite base of antennae. In frontal view, parafacials about one-half as wide as width of third antennal segment, reddish brown, with silvery gray pollen except on a bare shiny area below the pollinose spot on parafrontals. Parafrontals shiny bluish green to black, the frontal vitta reddish orange anteriorly. Parafrontal setulae somewhat more well developed than in the male but nevertheless hair-like. Anterior ocellar bristles short; inner and outer vertical bristles well developed.

The presutural dorsocentral hairs shorter than in the male or absent. Fore femora with the anterodorsal bristles shorter and less numerous. Calyptrae paler, not so yellowish.

TYPE MATERIAL: Holotype, male, Maiduguri, Nigeria, September 15, 1942; allotype, female, same data as holotype; paratypes, topotypical, two males, September 15, one male, September 6, one female, August 29, all in 1942 (F. M. Snyder).

The type series were all taken late in the afternoon in deep shade on human feces. In some of the specimens of each sex there is a very limited fulvous apical area on the last abdominal tergite similar to that in the one sex of *bimaculata* Stein.

***Orthellia splendida* (Adams)**

Paracompsomyia splendida ADAMS, 1904, Kansas Univ. Sci. Bull., vol. 3, p. 202.

Orthellia splendida MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 513. CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 14.

This species, in so far as I know, has not been recorded from West Africa and is apparently most abundant in the southern and eastern parts of the continent.

This species and *scatophaga* Malloch, *latifrons* Malloch, and *macrops* Curran appear to form a group within the genus. They have in common the basal part of either the entire wings or at least the discal cell devoid of the microscopic clothing setulae, facial setulae adjacent to the oral margin, while the males have an area of greatly enlarged eye facets on the dorsal anterior portion and the females of at least the first three species have relatively broad parafrontals opposite the ocellar tubercle and lack proclinate orbital bristles. In *splendida* the sternopleural bristles

are 1:2, and the posterodorsal calcar on the hind tibiae is very short or absent.

***Orthellia macrops* Curran**

Orthellia macrops CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 12.

Readily distinguished by the lighter colored second antennal segment, shiny green thorax which is overlain with whitish pruinescence on most of the presutural area, and with very greatly enlarged eye facets in the male above and in front. The bare area in the discal cell is in the form of a linear strip and lies parallel to the fifth vein. There are facial setulae adjacent to the oral margin, and the obtusely angled fourth vein has no dip beyond the bend.

Known to me only from the holotype male described from the Congo and a male from Maiduguri, Nigeria, September 15, 1942 (F. M. Snyder).

***Orthellia scatophaga* Malloch**

Orthellia scatophaga MALLOCH, 1924, Ann. Mag. Nat. Hist., ser. 9, vol. 14, p. 519. CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 11.

This species is quite similar to *latifrons* Malloch and is most readily separated from it by the characters mentioned in the key. The calyptrae of the females of both species are white, but in the males of *latifrons* they are distinctly brownish, while the males of *scatophaga* have both calyptrae white. The clothing setulae are almost entirely absent from the discal cell in *scatophaga*.

These notes are based on the four specimens from Cape Province mentioned by Curran and, as indicated, include a male and female from the same lot as the holotype.

***Orthellia latifrons* Malloch**

Orthellia latifrons MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 508; 1924, *ibid.*, ser. 9, vol. 14, p. 520 (note under *O. scatophaga*).

? *Orthellia indica* AUBERTIN, 1933, Ann. Mag. Nat. Hist., ser. 10, vol. 11, p. 141. CURRAN (*nec* Robineau-Desvoidy), 1935, Amer. Mus. Novitates, no. 788, p. 11.

After an examination of *Lucilia indica* Robineau-Desvoidy and *Cryptolucilia obscuripes* Stein (1918, p. 149), Aubertin concluded that these two Oriental species were identical and placed Malloch's African species *O. latifrons* in synonymy without having examined the type. Stein mentions the presence of an anterodorsal bristle

on the mid tibiae in *obscuripes*, a character not found in any African species known to me, and definitely absent in the female holotype of *latifrons* Malloch. Since both *indica* Robineau-Desvoidy and *obscuripes* Stein are from a faunal area different from that of *latifrons*, I am inclined to believe that there are two closely related species involved, namely, *latifrons* Malloch and the Oriental species *indica* Robineau-Desvoidy (or *obscuripes* Stein).

The type of *latifrons* Malloch is somewhat damaged and is at present part of the Malloch collection in the United States National Museum pending its eventual return to the Durban Museum. Three male specimens from Robertsport, Liberia, December 6 and 12, 1943 (F. M. Snyder), have been compared with the type of *latifrons* and are considered conspecific. Since the type is a female and the male is undescribed, the following description is given.

MALE: Length, 7.5 mm. Head black, with sparse gray pollen; back of head and lower part of cheeks with bluish to violet reflections and brownish to reddish ones in front. Parafrontals contiguous or subcontiguous; at its narrowest part, the front is not so wide as the diameter of the rather large anterior ocellus. Parafrontals with fine hair along their entire length, the anterior ones somewhat more well developed, but not so long nor so strong as the rather weak anterior, presutural, dorsocentral bristles. Parafacials widest below, as wide as greatest width of facial ridges, the former gradually narrowed above so that at their narrowest part they are one-half as wide as width of third antennal segment. In profile, juncture of parafacials and parafrontals scarcely distinguishable; cheeks 0.18 of eye height. Several facial setulae are present on the lower median part adjacent to the vibrissae. Facial ridges setulose on lower one-half. Palpi black. Second and root of third antennal segment reddish brown, the remainder of third segment dark brown; the third segment 3.0 times as long as second. Longest arisal hairs 0.6 as long as length of third antennal segment. Eyes bare, the facets considerably enlarged above and in front but not so large or so distinctly divided into two groups as in *macrops* Curran and a specimen determined as *obscuripes* Stein by Malloch in the United States National Museum.

Thorax bluish to purple, with greenish reflections in certain lights, and with sparse grayish pollen when viewed from in front. Acrosticals 0:1; dorsocentrals 2:3, the anterior postsutural one about one-half as long as the second, and the second one one-half

as long as the posterior one. With a pair of setulae between the posterior postsutural dorsocentrals and the prescutellar acrosticals, somewhat more well developed than the clothing setulae, about 0.6 times as long as the prescutellar acrosticals. Intra-alars 1; sternopleurals 1:2; the clothing setulae on scutellum somewhat longer adjacent to the apical bristles.

Legs black. Fore femora with the usual row of well-developed posterodorsal and posteroventral bristles. Fore tibiae without a strong median bristle. Mid femora with about four median anterior bristles which are as long as the greatest femoral diameter and with some long clothing setulae basad; the anteroventral surface with a row of long, fine, bristle-like hairs on the basal one-half which become shorter apically; with two to four long, slender, posteroventral bristles and with a strong median ventral bristle. Mid tibiae with five short posterior bristles and the usual strong median ventral to posteroventral bristle. Hind femora with a complete row of long anterodorsal and anteroventral bristles as well as a row of long posteroventral ones on the basal one-half. Hind tibiae with one anterodorsal, two anteroventral median bristles, and a strong posterodorsal calcar.

Wings hyaline, somewhat yellowish at base; clothing setulae absent, at least from the wing basad of the anterior cross vein. Curvature of fourth vein angular, as in figure 3. Third vein setulose midway to anterior cross vein above, and almost to tip of wing on the ventral surface; first vein bare except at base above and below. Upper calyptrae white, the margins somewhat yellow; lateral juncture of upper and lower calyptrae white; remainder of lower calyptrae brown. Halteres brown to fuscous, somewhat more orange near base.

Abdomen shiny; concolorous with thorax, the black clothing setulae on first three visible tergites decumbent except for a row of longer erect marginal setulae which are as long as the erect ones on the fourth visible tergite.

***Orthellia distinctipennis*, new species**

MALE: Length, 9 mm. Head in front black, cheeks and back of head bluish to green, all portions grayish pruinulent. In profile, the head about twice as high as its greatest length. Front at narrowest part as wide as distance across posterior ocelli inclusive. Frontal vitta narrowly complete along its entire length. Parafrontals at narrowest part 0.5 times as wide as anterior ocellus but

slightly wider at base of the antennae. Frontal vitta velvety black, at narrowest part as wide as diameter of anterior ocellus. In profile, juncture of parafacials and parafrontals 2.0 times as long as greatest arisal diameter; the parafacials scarcely narrowed below. Cheeks with short setulae, in profile 0.20 of head height. Parafrontals with short but numerous hairs, the anterior one or two pairs subequal to the longest setulae on second antennal segment. Ocellar bristles not differentiated, but the inner vertical bristles well developed. Facial ridges setulose along almost their entire length and with several facial setulae adjacent to oral margin between the vibrissae. Antennae black to brownish black, the third segment 3.3 times as long as second. Longest hairs on dorsal and ventral surfaces of arista together as long as the antennae or arista. With an area of somewhat enlarged facets on upper one-half of eyes, the largest of which are 0.5 to 0.6 times as large as the ocelli. Proboscis concolorous with head, subshiny. Palpi black, slender, parallel sided.

Thorax shiny green, but in certain lights it appears somewhat blue. Acrosticals 0:1; dorsocentrals 2:3, only the posterior postsutural pair well developed, and with a pair of bristles laterad of the prescutellar acrosticals which are subequal in development to these acrosticals. Intra-alars 1; pra short, about one-half as long as posterior notopleural bristle. Sternopleurals variable, 1:1 to 1:3; infra-alar bulla setulose. Both thoracic spiracles black.

Legs black. Fore femora with the usual row of strong postero-dorsal and posteroventral bristles. Fore tibiae without median bristles. Mid femora with a single short but stout median ventral bristle; the anterior series on basal one-half scarcely differentiated. Mid tibiae with five to six somewhat short posterior bristles on the basal two-thirds and with the usual ventral to posteroventral bristle situated on the apical one-third. Hind femora with the usual row of anterodorsal bristles, six strong anteroventral bristles on apical one-half, and some shorter and finer ones on basal one-half which become shorter from the base to middle; and with a distinct median posteroventral bristle. Hind tibiae with bristles not so long as tibial diameter, with one anterodorsal, two anteroventral, and a scarcely distinguishable posterodorsal calcar on apical one-third.

Wings brownish hyaline, darkened along fore margin as in figure 7. Third vein setulose to almost the anterior cross vein on

both surfaces; first vein setulose only at base above and below. Fourth vein curvature as in figure 5. Upper calyptrae and inner portion of the lower one slightly brownish, remainder yellow. Halteres brownish black.

Abdomen short, globose, shiny green, with somewhat bronze reflections. The clothing setulae short, upstanding, nowhere in well-differentiated rows.

FEMALE: Length, 9 mm. Similar to the male, differs in having the front at vertex 0.25 of head width, slightly wider at middle, then narrowed towards base of antennae. Parafrontals shiny bluish, each slightly wider than width of third antennal segment and with one strong and one weak forwardly directed, lateral, parafrontal bristle on each side. Anterior ocellar bristles short but distinct. The inner and outer vertical bristles stout, well developed. Pra almost as long as posterior notopleural bristle. Sternopleurals 1:2. Hind femora without the hair-like, anteroventral bristles on basal one-half. Wings with the infuscated area extending only to the third vein except basad of the anterior cross vein where it reaches the fourth vein. Wing vein setulae more distinct and well developed, those on third vein extending almost to the middle of its ultimate section on ventral surface. Abdominal clothing setulae decumbent on first three visible tergites.

TYPE MATERIAL: Holotype, male, Robertsport, Liberia, December 19, 1943; allotype, female, and paratype male, same data as holotype.

The type series were all collected on human feces near the native village of Zoo in deep shade. The single male paratype differs from the holotype in having the antennae somewhat more reddish brown and the sternopleurals arranged 1:1, as well as having the infuscated area on the wings extending slightly more posteriorly.

This species is quite similar to *intacta* Curran, but differs in having a distinct dip in the fourth vein beyond the bend (figs. 5 and 7), the male frontal vitta complete and the sternopleurals 1:1-2 as compared to 1:3, and having the posterodorsal calcar on the hind tibiae scarcely differentiated. The postsutural dorso-centrals in *intacta* are 2:4, although the anterior two pairs are weaker than the posterior ones and the bristles between the posterior postsutural acrosticals and dorsocentrals are scarcely differentiated.

Frequently small individual specimens have certain isolated

bristles absent or very short, while larger individuals have the corresponding bristles present or very well developed. Since the holotype of *intacta* Curran is smaller than *distinctipennis* (7 versus 9 mm.), it appears doubtful that the present species is a variation of *intacta*, especially since the smaller *intacta* has certain bristles, e.g., calcar on hind tibiae and postsutural dorsocentral bristles, more well developed.

***Orthellia racilia* (Walker)**

Musca racilia WALKER, 1849, List of the . . . dipterous insects in the . . . British Museum, vol. 4, p. 884.

Somomyia caffra BIGOT, 1877, Ann. Soc. Ent. France, ser. 5, vol. 7, p. 37.

Somomyia boersiana BIGOT, 1877, *ibid.*, ser. 5, vol. 7, p. 37 (in part).

Pyrellia nigrohalterata STEIN, 1913, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 11, p. 474.

Orthellia nigrohalterata MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 508.

Orthellia boersiana CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 11.

Orthellia racilia AUBERTIN, 1933, Ann. Mag. Nat. Hist., ser. 10, vol. 11, p. 143.

Besides the characters enumerated in the key, this species has distinct facial setulae adjacent to the oral margin, sternopleurals arranged 1:2, halteres brownish to black; and the lower calyptrae, especially of the male, brownish, with the color most intense near their inner basal margin. The costal margin basad to very slightly beyond the humeral cross vein is infuscated as in *sororella* Villeneuve, while the membrane adjacent to the other veins is quite yellowish in what appear to be older individuals, from the frayed conditions of the wings. One or two strong, submedian, postero-ventral bristles are present near the middle of the hind femora in both sexes. The females lack distinct proclinate parafrontal setulae. At their narrowest point, near middle of front, each parafrontal in the male is slightly wider than the diameter of the anterior ocellus, and the front at this point is about as wide as the distance across posterior ocelli inclusive. An occasional specimen may have a very limited bare area in the posterior basal corner of the discal cell, and for this reason might be traced to *scatophaga* Malloch in the key. These two species are somewhat similar, but the males of *racilia* can be separated from *scatophaga* by the much smaller eye facets above and in front and by the distinctly wider front. The front of the female of *racilia* is as wide as, or slightly narrower than, the greatest width of one eye, while the female front in *scatophaga* is distinctly wider than the eye, being

1.33 times its width. The halteres are similarly colored in both species, but the lower calyptrae are distinctly darker in *racilia* than in *scatophaga*.

These notes are based on the two specimens from the Congo studied by Curran, two others from Durban, Natal, identified by Malloch in the United States National Museum, and 36 males and eight females from Robertsport, Liberia, November and December, 1942, and one male from Jenewunde, Liberia, November 30, 1942 (F. M. Snyder).

Dr. van Emden has very graciously compared a male from the above Robertsport series with the type of *Musca racilia* Walker in the British Museum and reports that they are conspecific. He has likewise informed me that the types of *boersiana* and *caffra* Bigot are also in the British Museum and that the above male appears conspecific with the single female type of *caffra*. There are two males and one female under the name *boersiana* in the type series of this species. The female is conspecific with *caffra* and *racilia*, while the two males are considered by Dr. van Emden to represent the true *boersiana*, with which I am not acquainted. However, Dr. van Emden has forwarded notes which state that the two males under *boersiana* differ from each other in that one has a more markedly developed area of larger eye facets and the base of the discal cell devoid of clothing setulae. It is possible that *scatophaga* Malloch or *latifrons* Malloch is involved, but until specimens can be compared I do not care to go further regarding the synonymy.

***Orthellia chrysopyga* van Emden**

Orthellia chrysopyga VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 68.

Known to me from two cotype specimens from east Kilimanjaro, Tanganyika. Nothing needs to be added to van Emden's excellent description of and remarks on this species.

***Orthellia gemma* (Bigot)**

Pyrellia gemma BIGOT, 1878, Ann. Soc. Ent. France, ser. 5, vol. 8, p. 34.

? *Pyrellia distincta* VILLENEUVE, 1916, Ann. Soc. Ent. France, vol. 85, p. 148.

Orthellia distincta CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 17.
VAN EMDEN, 1939, Ruwenzori expedition 1934-5, vol. 2, p. 67.

Mr. J. E. Collin has kindly compared specimens captured in

Liberia (see below) with the single male type of *Pyrellia gemma* Bigot in his collection and considers them to be conspecific.

It is difficult to be certain which species Villeneuve had when he described *distincta*, since many species possess a distinct fringe of yellow hairs on the ventral surface of the hind tarsi.¹

The male specimen from the Cameroons studied by Curran has the anteroventral setulae on the hind metatarsi longer and more slender than in most species and the fringe of yellow hairs on the ventral surfaces is longer and more erect. Besides the specimens mentioned by Curran, I have seen 31 males and 22 females from Robertsport, Liberia, a female from Benduja, Liberia, and one female from Abouri, Gold Coast, taken in March to May and November to December, 1942 and 1943 (F. M. Snyder). They all agree in lacking setulae on the infra-alar bulla and in not having setulae on the dorsal surface of the first vein opposite the middle of the subcostal cell. All of the males have the row of anteroventral setae on the hind metatarsi as long as the hairs in the basal ventral tuft, although they are somewhat stouter. They also have two pairs of presutural dorsocentral bristles and a single intra-alar bristle on each side. Each hind femur bears a single long, fine, submedian, posteroventral bristle.

The series of 22 females collected at Robertsport exhibit a considerable degree of variation in the number of presutural dorsocentral and postsutural intra-alar bristles; 18 have three pairs of presutural dorsocentral bristles, two have two bristles on one side and three on the other, while only two have two dorsocentrals on each side; 10 have two intra-alars on each side, seven have three on each side, four have two on one side and three on the other, while one specimen has three on one side and four on the other. As in the males, they possess a single submedian posteroventral bristle on the hind femora.

There is also some variation in the total length of these flies; the longest is 6.5 mm., while the majority are 5 to 6 mm. long. The male and female specimens from the Cameroons are 7.0 and 7.5 mm. long, respectively, and have the same tarsal and femoral armature as the Liberian specimens, but the female has two pairs of presutural dorsocentral and two intra-alars on one side and three on the other.

(See also notes under *prima* Curran and *viola* Bigot.)

¹ See notes under *arctifrons* Stein in the list of Species not Included, at the end of this paper.

***Orthellia prima* Curran**

Orthellia prima CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 16.

This species is quite similar to *gemma* Bigot, having in common a bare infra-alar bulla, a single submedian, posteroventral bristle on hind femora, and long anteroventral setulae on the male hind metatarsi as well as long yellow hairs on the ventral surfaces of the basal two hind tarsal segments.

As in *gemma* Bigot, it has one or two hairs on the dorsal surface of the first vein opposite or basad of the humeral cross vein; however, it has one or more setulae on this vein opposite the middle of the subcostal cell on the dorsal surface.

Besides the holotype male, two female paratypes, and a female from Kamerunberg in the American Museum of Natural History, I have seen nine males and 21 females from Robertsport, one male from Jenewunde, and four females from Benduja, Liberia, taken in March to April and November to December 1943 (F. M. Snyder).

All the Liberian specimens, as well as the others, are 1 to 2 mm. longer than the specimens of *gemma* Bigot taken at Robertsport. The males of the two species agree in having two pairs of presutural dorsocentrals and a single intra-alar bristle on each side. In the 21 females from Robertsport, however, two have three pairs of presutural dorsocentrals, two have two on each side and three on the other, while 17 have two pairs; 17 have three intra-alars on each side, three have three on one side and four on the other, while one has four on each side.

A comparison of the samples of the females of the two species from the same locality (Robertsport) shows that 81 per cent of *prima* have three pairs of presutural dorsocentrals and 82 per cent of *gemma* have two pairs. On the other hand, all specimens of *prima* possess three or more intra-alars on one side or the other, while 45 per cent of *gemma* have two pairs of intra-alars, 36 per cent have three or four pairs, and 18 per cent have either two bristles on one side or three on the other.

***Orthellia pilarara*, new species**

Pyrellia viola BIGOT, 1878, Ann. Soc. Ent. France, ser. 5, vol. 8, p. 34 (in part).

MALE: Length, 6 mm. Head black, grayish pruinulent. Front at its narrowest part 1.25 times wider than diameter of anterior ocellus. Parafrontals contiguous except posteriorly

and with short, fine hairs along their entire length, being shorter than the longest setulae on second antennal segment. Inner vertical bristles as long as the vibrissae. In profile, juncture of parafrontals and parafacials not projecting more than the diameter of arista. Face without setulae adjacent to oral margin and the latter not extending anteriorly beyond the level of the base of antennae. Cheeks two times as high as width of third antennal segment. Eyes bare, the facets not greatly enlarged above. Antennae and palpi black, the former inserted opposite the middle of eyes. Third antennal segment 2.7 times as long as second. The longest aristal hairs 0.8 times as long as length of third antennal segment, more numerous and longer on the upper surface.

Thorax subshiny, dark greenish blue; when viewed from the side and behind with grayish pruinescence along the anterior declivitous portion of the mesonotum. It is most distinct on the anterior portion of the humeri and the center of the mesonotum. Clothing setulae short, rather sparse. Acrosticals 0:1; dorso-centrals 2:2-3; intra-alars 1; pra short but distinct; postalars 3, the posterior or most mesal one shortest, inserted almost on the ridge. Sternopleurals 1:2; infra-alar bulla not setulose; anterior spiracular flap pale yellowish white, the posterior spiracular flap deep brownish black.

Wings faintly brownish yellow hyaline, slightly darker basad of humeral cross vein. Entire wings covered with the usual clothing setulae. Setulae on third vein very short but continued well beyond anterior cross vein. Fourth vein curved forward obtusely, without a dip beyond bend. Subcostal sclerite brownish black and with only two or three hairs along the lower margin. Calyptrae brown, the upper one somewhat lighter, and with the lateral juncture of each, including the fringe of short hairs, white; halteres yellow.

Legs dark brown to black, subshiny. Fore femora normal. Fore tibiae without a median bristle and with the usual apical dorsal and posteroventral bristle. Fore tarsi scarcely as long as fore tibiae. Mid femora with a row of short but strong ventral and anterior bristles on the basal one-half. Mid tibiae with three or four posterior bristles and one long, strong, posteroventral to ventral bristle. Hind femora with a complete row of anteroventral bristles which become longer and stronger apically, all distinctly longer than femoral diameter, and with a long postero-

ventral bristle on the basal one-third and sometimes with a slightly shorter one near by. Hind tibiae with one anterodorsal bristle, two anteroventral bristles, and with the posterodorsal calcar much longer and stronger than the other hind tibial bristles. Hind tarsi without conspicuous ventral hairs.

Abdomen shiny blue-green, the basal segment on ventral surface with dense gray pruinescence. Clothing setulae on tergites short, not distinctive, those on fourth visible tergite longer and more upright but not in distinct series.

FEMALE: Length, 6.5–7.5 mm. Head black, grayish pruinose, the parafrontals shiny black laterally, slightly dusted mesally. Front at vertex 0.3 of head width, parallel sided. The frontal vitta black, slightly velvety. The frontal triangle is distinct only when viewed in certain angles and does not extend anteriorly more than as a faint mark. Parafrontal bristles short, not so long as anterior ocellars and without interspersed hairs; with one long and one short lateral proclinate parafrontal bristle. Inner and outer vertical bristles well developed. Juncture of parafacials and parafrontals in profile extending 0.75 the width of third antennal segment anteriorly. The oral margin projecting slightly beyond level of base of antennae.

Thoracic pruinescence more distinct than in male; sternopleurals 1:2–3 and dorsocentrals 2:2–5, only the posterior two postsutural pairs long. Bristles on ventral surface of mid and hind femora shorter and less numerous. Other characters similar to those of male.

TYPE MATERIAL: Holotype, male, Bwamba, Kenya, April, 1944 (Van Someren); allotype, female; and paratypes, one male and three females, same data as holotype; one male and one female, topotypical, August 7, 1946 (Van Someren).

Holotype, allotype, and three paratypes in British Museum (Natural History); other paratypes in the American Museum of Natural History and author's collection.

Also before me is one of the two females of the *viola* Bigot type series from Collin's collection. It is rather dusty and therefore it is quite difficult to be sure regarding certain color characters. The anterior spiracle appears to be dark and the general ground color more bluish, while the last abdominal segment has somewhat more dense whitish pruinescence. Because of this, it is not included in the type series, although I believe it to be conspecific.

***Orthellia pilarara vansomereni*, new subspecies**

FEMALE: Length, 7 mm. Very similar to *pilarara pilarara* but differs in having the palpi and third antennal segment light brown, the presutural dorsocentrals very short and scarcely differentiated from the more upright clothing setulae; sternopleurals 1:3. The fore margin of the wings with a brown cloud which extends from base to apex of wing and reaches posteriorly to the third vein.

TYPE MATERIAL: Holotype, female, Bwamba, Kenya, April, 1944 (Van Someren), in British Museum (Natural History).

It is possible that this subspecies is the same as *Cryptolucilia marginipennis* described by Stein (1918, p. 187). As Malloch (1923, p. 510) points out, Stein's type should be examined before its true identity can be established. I have preferred to consider the present subspecies to be distinct, since Stein's description would indicate that *marginipennis* has two strong presutural dorsocentral bristles and is longer, while it is likely that the whitish pruinose presutural spot noted by Stein would be more prominent than in *vansomereni*. The general color, darkened fore margin of wings, and the 1:3 sternopleurals mentioned by Stein are suggestive of the present subspecies.

***Orthellia abnormis* Malloch**

Orthellia abnormis MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 512; 1925, *ibid.*, ser. 9, vol. 17, p. 366. CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 11.

A female specimen labeled "type" and bearing the same data as mentioned by its author is at present in the Malloch collection in the United States National Museum pending its eventual return to the Durban Museum. It has been badly damaged by dermestids, the head as well as most of the thorax and abdomen being missing. Besides this specimen, there is a damaged male which is presumably the specimen mentioned by Malloch in the second reference above. The front is still entire, although the eyes, mouth parts, and a large portion of the thorax are destroyed in this specimen. Besides the above specimens, I have seen 28 males and five females from Freetown, Sierra Leone, August, 1942; Abouri, May and June, 1942, Sinasi to Yeboui, Gold Coast, June, 1942, and Robertsport, Liberia, April to December, 1943 (F. M. Snyder), one male, Kakatown, Liberia,

August 18, and a female, Kamerunburg, in the American Museum of Natural History; one male, Makueni, Ukamba, May, 1947, one male, Teita Hills, Kenya, August, 1947 (Van Someren) in the British Museum (Natural History).

In Malloch's male specimen the front at the narrowest part is not twice as wide as the third antennal segment unless the left to right thickness is considered; rather it appears to be as wide as the dorsal-ventral or anterior-posterior width, depending upon how the antenna is assumed to be held. The frontal vitta at its narrowest part is as wide as the distance across posterior ocelli inclusive. In the series of specimens examined, the frontal width appears to vary from a distance equal to twice the diameter of the anterior ocellus to a distance equal to slightly more than the distance across posterior ocelli inclusive. All males, likewise, possess two anteroventral bristles on the hind tibiae as do all of the females except the type. I am therefore inclined to believe that the one anteroventral bristle mentioned by Malloch in this species is an abnormality. The facial setulae are absent in all of the specimens seen except in the type where, owing to the lack of the head, this is impossible to determine.

The calyptrae are yellowish brown in the males of this species and of *pura* Curran, but the front in the latter is narrower, the parafrontals being contiguous or subcontiguous, and the frontal vitta at its narrowest point is only 0.8 times as wide as the diameter of the anterior ocellus. The calyptrae in *pura* females are concolorous with those of the male, but in *abnormis*, the female calyptrae are whitish. The parafrontal bristles are moderately well developed in the males of both *pura* and *abnormis*, and there may or may not be a few short, interspersed, parafrontal hairs in both species.

Orthellia orbitalis (Stein)

Pyrellia orbitalis STEIN, 1913, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 11, p. 470. MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 519.

Orthellia orbitalis CURRAN, 1928, Bull. Amer. Mus. Nat. Hist., vol. 57, p. 358; 1935, Amer. Mus. Novitates, no. 788, p. 14.

Known to me only from a single female from Stanleyville, Congo, recorded by Curran. The presence of an orbital bristle in the male should at once distinguish it from other African *Orthellia*. (See also the remarks under the following species.)

***Orthellia vera* Curran**

Orthellia vera CURRAN, 1928, Bull. Amer. Mus. Nat. Hist., vol. 57, p. 359; 1935, Amer. Mus. Novitates, no. 788, p. 14.

Known to me only through the type and allotype from the Belgian Congo in the American Museum of Natural History and one damaged male from Bwamba, Kenya, August 7, 1946 (Van Someren) in the British Museum (Natural History). Both type specimens are quite dusty, and most of the legs are missing, and all four fore pairs are absent in the holotype, and only one fore and one hind leg are present in the allotype; most of the thoracic bristles are missing in all specimens.

The species appears to be very similar to *orbitalis* Stein and can best be separated by those characters used by Curran and presented in the key. The third antennal segment of both species is quite long, being 3.3 to 3.6 times as long as the second. The lower portion of the face in the specimens of both species is damaged, so that it has been impossible to determine with certainty whether facial setulae are present or absent. For this reason the species have been keyed twice.

Until more material in a better state of preservation can be examined, the specimens are considered to represent distinct species, though I am by no means convinced that the above female specimens represent different species.

***Orthellia intacta* Curran**

Orthellia intacta CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 10.

This species is known to me only from the holotype. Apparently there was a typographical error in the original description, since the five to six bristles on the mid tibiae are postero-dorsally and not anterodorsally situated. The frontal vitta is completely obliterated in the middle, and the front at this point is not so wide as the anterior ocellus. (See also remarks under *distinctipennis*, new species.)

***Orthellia pura* Curran**

Orthellia pura CURRAN, 1928, Bull. Amer. Mus. Nat. Hist., vol. 57, p. 358; 1935, Amer. Mus. Novitates, no. 788, p. 11.

In the addition to the holotype female from Stanleyville, Congo, there is a series of 23 males and 36 females taken from October to December, 1943, at Robertsport and Benduja, Liberia;

Abouri, Gold Coast (F. M. Snyder), and one male, Kumasi, Gold Coast (J. Bowden), in the British Museum (Natural History) before me. This species is very similar to *abnormis* Malloch but can be separated from it by the presence of one or more facial setulae adjacent to the oral margin. (See also remarks under *abnormis* Malloch.)

***Orthellia analis* Curran**

Orthellia analis CURRAN, 1935, Amer. Mus. Novitates, no. 788, p. 21.

Known to me only from the holotype, allotype, and one male paratype from Burunga, Congo. Aside from the characters enumerated in the key nothing need be added to Curran's excellent description. I hesitate to follow van Emden (1939, p. 68) in placing this species in synonymy with *aureopyga* Malloch (1923, p. 510), since Malloch specifically mentions the brassy color of the fourth abdominal tergite in the male of his species, while in *analis* all of the abdominal tergites are concolorous blue in both sexes and the type series certainly appear to be conspecific. (See also the remarks under the following species.)

***Orthellia maculisquama* (Villeneuve)**

Pyrellia maculisquama VILLENEUVE, 1916, Ann. Soc. Ent. France, vol. 85, p. 147.

Orthellia maculisquama VILLENEUVE, 1926, Rev. Zool. Afrique, vol. 14, p. 67. MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 517.

There are a male and a female specimen identified as *maculisquama* Villeneuve and made available for study by Dr. van Emden before me. They certainly agree with Villeneuve's descriptions and remarks in the references cited above. A study of these specimens as well as the description of *aureopyga* by Malloch suggests that there may have been an error in associating the sexes by both authors. In the description of the female (holotype) of *maculisquama*, Villeneuve mentions the brassy ("viridis aureis") color of the last abdominal tergite, while Malloch mentions the brassy or golden color of the last tergite in his species. Malloch's description indicates also that the color of the calyptrae is white in both sexes, while Villeneuve associates a male with cream-colored calyptrae with the holotype female with dark calyptrae. It is suggestive that the female holotype of *maculisquama* (1916) and the male holotype of *aureopyga* Malloch (1923) are con-

specific, while the sexes associated by both authors (Malloch, 1923, female; Villeneuve, 1926, male) represent a second species closely allied to, or possibly identical with, *analis* Curran. If the above should prove correct, then there is an interesting case in which a female with dark calyptrae is associated with a male with light calyptrae, which is quite the opposite of what occurs in some species within the genus, e.g., *abnormis* Malloch and *pura* Curran.

However, until a long series of specimens as well as the types of all three species can be compared, I hesitate to place any of them in synonymy.

Orthellia viola (Bigot)

Pyrellia viola BIGOT, 1878, Ann. Soc. Ent. France, ser. 5, vol. 8, p. 34.

Orthellia spinthera MALLOCH (*nec* Bigot), 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 513. CURRAN, 1928, Bull. Amer. Mus. Nat. Hist., vol. 57, p. 358; 1935, Amer. Mus. Novitates, no. 788, p. 13.

I am greatly indebted to Mr. J. E. Collin for supplying many notes upon which the following remarks are based. Under the name *Pyrellia viola* Bigot in Collin's collection of the Bigot types, there are two female specimens that are considered to be cotypes of this species. Unfortunately, Bigot failed to mention the number of specimens he had when describing this species, although he noted that the sex was male.

One of these two female specimens lacks infra-alar bullar and facial setulae; it is considered to represent the species described above under the name *O. pilarara*, new species. I consider the other specimen to represent the true *viola*, and it appears to be conspecific with the species identified as *O. spinthera* Bigot by Malloch and Curran. However, the type of *spinthera* is a true *Pyrellia* as mentioned by van Emden (1939, p. 66). Mr. Collin has kindly compared a male and a female taken at Robertsport, Liberia, with the type of *viola*, and his notes would indicate that they are conspecific.

The following redescription is based on five males and 12 females from Robertsport, Liberia, near the native village of Zoo, taken on human feces, December 19, 1943; one female, Benduja, north central Liberia, December 1-2, 1943 (F. M. Snyder), one male and one female, Lengatown, Liberia, August 12, 1926, one female, Memehtown, Liberia, August 29, 1926, in the American Museum of Natural History, and one female, Bwamba, Kenya, August 7, 1946 (Van Someren) in the British Museum (Natural

History), one female, Mimbibusi, May 3, 1909, determined as *spinthra* Bigot by Bezzi, in the United States National Museum.

MALE: Length, 6–7 mm. In certain lights back of head shiny blue, remainder of head black, the parafacials grayish pollinose. Viewed from in front the parafacials and parafrontals are very narrow, in profile their juncture only slightly longer than greatest arisal diameter. With a complete row of short parafrontal setae, the anterior ones only slightly more well developed. The front at its narrowest part about as wide as distance across posterior ocelli inclusive. The velvety black frontal vitta narrowly complete along its entire length. Only the inner vertical bristles strongly developed; the ocellars undifferentiated. Cheeks in profile 0.15 of eye height. Facial ridges setulose on lower one-half. With short but distinct facial setulae near oral margin between the vibrissae. The oral margin in profile not produced anteriorly beyond a level of juncture of parafacials and parafrontals. Eye facets slightly enlarged above and in front. Antennae and palpi black. Third antennal segment 2.5 times as long as second; longest arisal hairs 0.75 as long as length of third antennal segment.

Thorax violet to blue, with greenish reflections when observed at certain angles; viewed from in front with very thin grayish to brownish pollen. The sternopleura not conspicuously pollinose. Acrosticals 0:1; dorsocentrals 2–3:3–5, the anterior presutural dorsocentral opposite or slightly anterior to level of anterior posthumeral bristle and the posterior presutural dorsocentral opposite the level of the posterior posthumeral bristle, and sometimes with a much shorter and weaker anterior presutural dorsocentral setula which is scarcely longer than the clothing setulae. With three pairs of distinct postsutural dorsocentral bristles, of which the posterior two pairs are longer than the others, and occasionally with one to two pairs of very much shorter anterior ones. With a pair of short bristles between the posterior postsutural dorsocentral bristle and the prescutellar acrostical. Intra-alars 1; pra as long as posterior notopleural bristles. Sternopleurals 1:3; intra-alar bulla setulose.

Legs black, in some lights with bluish black reflections. Fore femora with the usual posterodorsal and posteroventral rows of bristles. Fore tibiae without a median bristle. Mid femora with one or two short but distinct median anterior bristles and a few much shorter ones basad; one strong basal anteroventral bristle,

a strong median ventral bristle, and two more slender, basal, ventral to posteroventral bristles. Mid tibiae with about five posterior bristles and the usual strong median ventral to posteroventral bristle. Hind femora with the usual row of anterodorsal bristles, a complete row of five to seven anteroventral ones, of which the basal ones are more slender, and with two posteroventral bristles on the basal one-half. Hind tibiae with a strong median anterodorsal bristle and a row of shorter bristles basad of which one or two may be slightly more well developed than the others and with two or three median anteroventral bristles and a strong posterodorsal calcar. Hind tarsi with the clothing setulae on the first three segments reddish and somewhat longer than usual.

Wings hyaline, at most with a slightly yellowish tinge towards base. Fourth vein not angularly bent; without areas devoid of clothing setulae; third vein setulose above and below to slightly beyond the anterior cross vein. First vein without setulae except at base above and below. Calyptrae slightly darkened when viewed in certain lights; without darker margins. Halteres yellow to brownish orange.

Abdomen concolorous with thorax, the first three visible tergites with decumbent setulae except for a row of short, upright, apical setulae on third tergite and the fourth with all of the setulae upright and the apical row slightly more well developed than the others.

FEMALE: Length, 5 to 7 mm. Similar to the male, only the parafacials and ventral one-half of head pollinose. Front at vertex 0.27 of head width, slightly narrowed towards base of antennae. The parafrontal bristles more well developed and with one strong and one weak proclinate bristle on upper one-third laterad of the parafrontal bristles. Inner and outer vertical bristles well developed, the anterior ocellars distinctly differentiated but not so well developed as the outer verticals.

***Orthellia macroviola*, new species**

FEMALE: Length, 7–9 mm. Head black, the dorsal two-thirds of parafrontals and the back of head shiny violet-blue, the remainder with thin gray pollen. Oral margin not protuberant beyond a level of juncture of parafacials and parafrontals when viewed in profile. Front at vertex 0.30 of head width, very slightly narrower at base of antennae. Parafrontals widest adjacent to ocellar triangle, then narrowed abruptly, thereafter of

uniform width to base of antennae; at narrowest part, each parafrontal 0.25 of greatest frontal vittal width. With a complete row of cruciate parafrontal bristles, the anterior and posterior ones strongest, the latter inserted slightly anterior to a level of the anterior ocellus. With a strong reclinate parafrontal bristle opposite the posterior ocelli and with one strong and one weak proclinate parafrontal bristle laterad of the posterior pair of cruciate parafrontals. Postocellar bristles undeveloped, the anterior ocellar bristles very strong and almost equal in development to the outer verticals and about 0.66 times as long and strong as the inner verticals. With a pair of moderately developed, inwardly directed bristles behind the outer verticals. In profile, the juncture of parafacials and parafrontals as long as the width of third antennal segment; parafacials narrowed to 0.50 this distance below. Cheeks 0.13 of eye height. Facial ridges setulose on the lower one-half. With short setulae on face adjacent to oral margin. Palpi and antennae black, third segment of the latter 2.75 to 3.0 times as long as the second. Longest arisal hairs 0.75 of third antennal segment length.

Thorax purplish blue, with somewhat greenish reflections; when viewed from in front with sparse brownish pollen. When viewed laterally the sternopleura whitish pollinose and appearing densest on lower one-half. Acrosticals 0:1; dorsocentrals 2:4-5, the anterior presutural pair much shorter than the pair behind them which are inserted more anteriorly than usual, and are opposite the level of the anterior posthumeral bristle. The posterior two pairs of postsutural dorsocentrals quite long and strong, the anterior two or three pairs about equal in development to the short anterior presutural pair. Intra-alars 1; pra as long as posterior notopleural bristle; postalars 3; sternopleurals 1:3; infra-alar bulla setulose. Both spiracles black.

Legs black. Fore femora with the usual row of strong postero-dorsal and posteroventral bristles. Fore tibiae without strong median bristles. Mid femora with a single strong, median, anterior and ventral bristle, a strong basal anteroventral bristle, and one to three long, hair-like, basal, ventral bristles. Mid tibiae with four to five strong posterior bristles and the usual strong submedian ventral to posteroventral bristle. Hind femora with a complete row of six long, slender, anteroventral setae; one or two long, slender, hair-like, posteroventral setulae on the basal one-fourth and with the usual row of anterodorsal bristles. Hind

tibiae with a median anterodorsal bristle, basad of which is a row of short setulae; two anteroventral bristles and a strong postero-dorsal calcar.

Wings light yellowish brown hyaline; the fourth vein obtusely curved forward as in figure 1. Third vein setulose to about middle of ultimate section on both surfaces; first vein setulose above and below only at base. Knobs of halteres pale yellow; calyptrae yellowish white, the margins more yellowish.

Abdomen concolorous with thorax. Clothing setulae decumbent on all tergites but the fourth with a row of six to eight strong, erect, discal bristles; the lateral apical decumbent setulae on second and third visible tergites longer than others.

TYPE MATERIAL: Holotype, female, Abouri, Gold Coast, June 28, 1942; paratypes, two females, topotypical, May 31, 1942; one female, between Sinasi and Yeboui, Gold Coast, June 7, 1942; one female, Benduja, Liberia, December 1-2, 1943; seven females, Robertsport, Liberia, March 3, September 24, November 8, 15, and December 8, 1942 and 1943 (F. M. Snyder).

In most species of this genus there is a short bristle on the anterior declivitous portion of the thorax in line with the dorsocentral series of bristles. If this bristle, which is more prominent in this species, is counted then *macroviola* would be considered to have three pairs of presutural dorsocentral bristles. However, the anterior insertion of the posterior presutural dorsocentral bristle (of two or three pairs) should readily distinguish this species.

SPECIES NOT INCLUDED

arctifrons STEIN (*Pyrellia*), 1913, Ann. Hist. Nat. Mus. Natl. Hungarici, vol. 11, p. 472. Until authentic specimens of this species can be examined, I prefer to omit it.

After the present paper was submitted for publication, van Emden's third report on African Muscidae appeared [1951, "Muscidae C, Scatophaginae... Phaoniinae." Ruwenzori expedition 1934-5, British Museum (Natural History), vol. 2, no. 6, pp. 325-710]. In it (p. 701) he reports having seen the type of this species and that it is the same as *Pyrellia distincta* Villeneuve. It should be noted that in 1852 Walker also described a *Pyrellia distincta* which van Emden in the above reference (p. 700) places in the genus *Pyrellina* Malloch. (See notes under *gemma* Bigot.)

aureopyga MALLOCH, 1923, Ann. Mag. Nat. Hist., ser. 9, vol. 12, p. 510. (See remarks under *maculisquama* Villeneuve.)

marginipennis STEIN (*Cryptolucilia*), 1918, Ann. Hist. Nat. Natl. Hungarici, vol. 16, p. 188. (See remarks under *pilarara vansomereni*, new subspecies.)

superba KARL, 1935, Arb. Morph. Taxon. Ent. Berlin-Dahlem, vol. 2, p. 35. No specimens have been seen which could with certainty be determined as this species, and the description is not complete enough to warrant including it.

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