

MAURICE T. JAMES

*A Partial Revision of
the Oriental Isomyia
of the Viridaurea Group
(Diptera: Calliphoridae)*

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ABSTRACT

Maurice T. James. A Partial Revision of the Oriental *Isomyia* of the Viridaurea Group (Diptera: Calliphoridae). *Smithsonian Contributions to Zoology*, 67: 1-14, 1970.—The group is defined and, except for some species of the *delectans* group, reviewed. A key to species is presented. The following new species are described: *Isomyia lugubris* and *I. facialis* from Thailand; *I. chalconotum* from Malaysia; *I. marginata*, *I. iris*, and *I. discalis* from Philippine Islands; and *I. aurifacies* and *I. perisi* from India. New combinations are *I. gomezmenori* (Peris), *I. ceballosi* (Peris), and *I. borneensis* (Peris), all from *Thelychaeta*, and *I. pseudolucilia* (Malloch) from *Strongyloneura*. A lectotype is designated for *Thelychaeta chalybea* Brauer and Bergenstamm, a synonym of *Isomyia viridaurea* (Wiedemann).

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Maurice T. James

A Partial Revision of the Oriental *Isomyia* of the *Viridaurea* Group (Diptera: Calliphoridae)

The Oriental species of *Isomyia* have been studied by several workers, the most comprehensive treatment being that of Peris (1952). Peris used the generic name *Thelychaeta*, but acknowledged the fact that *Isomyia* had priority. He divided the genus into several groups, one of which, the *viridaurea* group, was characterized principally by having the thoracic squama lobulate, that is, produced inwardly so that its inner margin comes into contact with the scutellum. Some members of the *dotata* group share this character but they are distinguished from *viridaurea* and its allies by having the stem vein or R_1 (Peris says the subcosta) setulose below, whereas this vein is bare below in the *viridaurea* group. Peris refers one species, *I. chrysoides* (Walker), to this group, even though its thoracic squama is not of the type described above, on the basis of its overall similarity to other members of the group, and I concur with his opinion in this respect.

Malloch (1928), in his study of what he called *Strongyloneura*, had laid some foundation for Peris' grouping by pointing out the significance of the squamal structure and the ventral setation of vein M_1 . He called what is essentially the *viridaurea* group his group B, with the statement that it was "probably equivalent to *Thelychaeta*, B. & B." Senior-White, Aubertin, and Smart (1940) followed Malloch in the essential aspects of their key but did not give any grouping of the species; they used the generic name *Strongyloneura*, though they indicated in a footnote that the proper name was *Isomyia*. They included *I. chrysoides* (Walker), along with *I. viridaurea* (Wiede-

mann), *I. pseudolucilia* (Malloch), *I. oestracea* (Séguy), and *I. delectans* (Walker), under the section of the key defined by the inwardly projecting thoracic squama. Séguy expanded this section, which he called the genus *Isomyia*, by the inclusion of four more of his species; he retained *I. chrysoides* here, without explanation.

Peris was unable to deal satisfactorily with a complex which includes *I. delectans* (Walker), and I have been but little more successful. A considerable amount of material in this species complex and a careful study of available types will be necessary before this problem can be solved. The *viridaurea* group apparently is rich in species, and the present paper, with the key it contains, can be considered only a contribution toward the taxonomy of the group. The necessity of describing so many species from single specimens is unfortunate, but in all cases these species are so well marked that this course is justified.

The type-species of *Thelychaeta* Brauer and Bergenstamm, 1891, is *T. chalybea* Brauer and Bergenstamm, 1891, is *T. chalybea* Brauer and Bergenstamm, a synonym of *Musca viridaurea* Wiedemann. That of *Isomyia* Walker, 1860, is *Musca delectans* Walker. Both nominal genera, therefore, are based on species in the *viridaurea* group. *Strongyloneura* Bigot, 1886, as restricted by Peris, is quite a different group, based on *S. prasina* Bigot as its type-species, and certainly is not congeneric with the *Isomyia* species.

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This study was based on material from several collections, particularly those of the National Museum of Natural History; British Museum (Natural History),

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from the Malay States Museum; Natural History Museum of Vienna; Michigan State University; and Washington State University. Most holotypes and allotypes are in the National Museum of Natural History (USNM). Paratypes of all species other than those described from unique specimens are in the Washington State University collection; the holotype and allotype of *I. perisi* are being donated to the National Museum of Natural History, and one paratype of that species is being given to the British Museum (Natural History); the holotype and allotype of *I. chalconotum* are in the British Museum (Natural History).

Morphology

Most terms used here are more or less standard, but some require explanation. The term "face" is applied to the area between the antennal bases and the oral margin, and between the facials or facial ridges; it includes what Townsend calls the epistoma, but which actually is not that structure. No description is included for the palpi and proboscis; they do not vary significantly in color or structure. The palpi are always spatulate, rather inflated, and orange to orange-yellow. The antennae vary little in structure; the arista is set with long rays, longer above than below. The antennae are separated from each other at the base, and usually there is a more or less well-developed facial carina. Thoracic chaetotaxy seems to be subject to some variation. An accessory propleural and an accessory stig-

matal, in every case shorter and weaker than the true propleural or stigmatal, may be present. Some variation of significance occurs in the pteropleural(s); this is indicated in the descriptions. There are three or four strong lateral scutellars, the number being of definite taxonomic significance; this count does not include a strong setula or weak bristle (always present) basad of the basal lateral scutellar. The term setula is applied to stout, bristle-like hairs; the softer vestiture is designated as composed of hairs. A group of setulae occurs below the notopleural suture, on the anterior part of the mesopleuron; this group of setulae usually is clearly differentiable from the rest of the vestiture of the mesopleuron and is characteristic of the genus. A row of bristles occurs on the posterior margin of the mesopleuron, but in addition to this, and rising slightly behind it, is a row of long hairs, about as long as the bristles and lying parallel to them, of texture more like setae but usually with some softer hairs intermixed. This row of hairs is designated as the posterior mesopleural fringe.

The apparent, rather than the actual, segmentation of the abdomen is used; the first tergum, therefore, actually is the second morphological tergum. The first two sterna are evident. The structure of the male genitalia shows only moderate variation within this group, and genital structures are illustrated whenever dissections are made. Measurements, except overall length, are in micrometer units (60 = 1 mm). Unless otherwise indicated, measurements are of the holotype or allotype.

Taxonomy

Key to the Oriental species of the *Isomyia viridaurea* group

1. Lunule with several short black setulae 2
Lunule bare of setulae; fourth abdominal tergum, if densely pollinose, not contrasting with preceding terga either in pollen or in coloration; color predominantly green or blue. 3
2. Color overall black with purplish reflections; pollen of mesonotum and of dorsal aspect of abdomen cinereous, rather uniform in density except on posterior margins of abdominal terga, where it is inconspicuous, nowhere obscuring ground color. *I. lugubris*, new species
Fourth abdominal tergum green dorsally, with dense, ashy pollen which, at least from posterior view, largely conceals background, preceding terga dark blue to purple and almost devoid of conspicuous pollen; mesonotum and, to a lesser extent, pleura deep coppery (female) or green with coppery reflections (male), in striking contrast to the dark blue to purple first three abdominal terga. *I. chalconotum*, new species
3. Pile of mesopleuron, and of other pleural areas as well, soft and yellow to golden, except for usual black setulae below notopleural suture; covering of anterior spiracle yellow. 4
Pile of pleura more extensively black than indicated above, with some soft black hairs on mesopleuron, sometimes remote from notopleural suture, and on sternopleuron. 8
4. Basicosta bright yellow. 5
Basicosta brown to black; abdomen violet, intermediate terga with broad black margins, thorax blue with violet reflections on mesonotum and scutellum. *I. marginata*, new species

5. Thoracic squama not lobulate; facets of eye of male strikingly larger above than below; pollen of abdomen ordinary, usually not visible except from posterior view.
I. chrysoides (Walker)
 Thoracic squama lobulate; facets of eye of male larger above than below but not strikingly so.....6
6. Pleura and abdomen densely pollinose in male, less so in female, but dorsal parts of fourth tergum, when viewed laterally at an angle, with a tessellated pattern of pollen which, in the proper light, obscures, or virtually obscures, the background; black bristles of lateral slopes of first tergum surrounded, at least on three sides, by pale hairs.
I. viridaurea (Wiedemann)
 Pleura and abdomen less densely pollinose and without a tessellated pattern; black bristles of lateral slopes of first tergum with some black hairs in front and behind as well as above...7
7. First abdominal tergum with black hairs at base; eyes of male separated by much less than width of ocellar triangle, the frontale interrupted at narrowest part of frons.
I. gomezmenori (Peris)
 First abdominal tergum with yellow hairs at base; eyes of male separated by about width of ocellar triangle, frontale evident.....*I. pichoni* (Séguy)
8. Four strong lateral scutellars, the last three spaced at closer intervals than the basal one....9
 Three strong lateral scutellars, spaced at approximately equal intervals.....12
9. Both squamae pale yellow; posterior mesopleural fringe yellow; some pile on notopleuron, lower part of mesopleuron, and part of sternopleuron yellow to yellowish.
I. pseudolucilia (Malloch)
 At least thoracic squama mostly brown; pile of notopleuron and of pleura wholly black or dark brown.....10
10. Gena, parafrenal, and parafacial black, lower part of parafacial and part of gena devoid of pollen and shining; squamae whitish on basal part.....*I. ceballosi* (Peris)
 Gena golden to brownish yellow, it and parafacial wholly pollinose; squamae entirely brown to blackish brown.....11
11. Lunule entirely pollinose; lunule, parafrenal, parafacial, and gena uniformly golden brown pollinose.....*I. aurifacies*, new species
 Lunule shining anteriorly; pollen of parafrenal and parafacial not uniformly colored, cinereous to brownish.....*I. perisi*, new species
12. Disc of mesonotum largely black, contrasting to lateral slopes and prescutellar area of mesonotum, which, along with the scutellum, are bluish green or purple.....13
 Disc of mesonotum not conspicuously bicolored.....14
13. Pleural pile wholly black to dark reddish brown, dense and long; squamae wholly brown; a robust, purplish species.....*I. iris*, new species
 Pile of pleura posterior to and including posterior mesopleural fringe yellow to golden, pile much less dense than in *I. iris*; lower part of thoracic squama white, squamae otherwise brown; a more slender, blue green species.....*I. discalis*, new species
14. Pleura with extensive yellow hair, at least around stigmatal and propleural bristles and on part of sternopleuron; posterior mesopleural fringe golden.....15
 Pleural hairs entirely black or virtually so; posterior mesopleural fringe brown to black....17
15. Hairs covering anterior spiracle bright yellow to golden.....16
 Hairs covering anterior spiracle dark brown to black (some other species of the *delectans* complex may run here).....*I. delectans* (Walker)
16. Tibiae yellow; parafrenal in female subequal to frontale in width at middle of frons; parafacial in male almost twice as wide as antennal flagellum.....*I. electa* (Villeneuve)
 Tibiae brown; parafrenal in female about half as wide as frontale; parafacial in male about 1.5 times as wide as antennal flagellum.....*I. borneensis* (Peris)
17. Upper and lower squamae wholly dark brown to black.....18
 Upper and lower squamae white, at least at base.....19
18. Face dark brown to black, especially above vibrissae.....*I. pictifacies palauanensis* James
 Face bright yellow to orange yellow.....part of the *delectans* complex
19. Upper squama, in both sexes, white on basal half or more; lower squama white at base; larger species, 10.0–11.0 mm in length.....*I. pictifacies* (Bigot)
 Upper and lower squamae wholly white in female, upper one white only anteroventrally in male; smaller species, 7.0–9.0 mm in length.....*I. facialis*, new species

Isomyia lugubris, new species

FEMALE.—Parafacials, parafrontals, occiput, ocellar triangle, and postgena mostly black, covered, except for glabrous area of occiput, with cinereous pollen, densest on occipital orbits, on parafacials and parafrontals with a slightly yellowish tinge. An indefinite area on each parafrontal, side of ocellar triangle, and upper part of vertex orange yellow; pollen as on parafrontals. Frontale reddish brown, partly with a dull purplish sheen. Cheek grooves and gena reddish brown, gena becoming yellow next to black area; pollen of gena golden, a very small, poorly defined, glabrous spot at contact with parafacial, below eye. Lunule orange-yellow, largely glabrous but with some pollen visible from behind; facials and face yellow, uniformly dulled with white to yellow pollen. Frontale twice or more width of parafrontal except below, on lower half almost parallel-sided, bulging slightly at middle, then narrowing to vertex. Bristles, setulae, and hairs of head black except on occiput, postgena, and gena along oral margin. About 11 frontals; frontal setulae prominent, some approaching bristles in size; lunule with distinct black setulae; parafacials with setulae arranged in about three irregular rows. Antenna orange-yellow, flagellum becoming clearer yellow at base and brownish yellow toward apex; flagellum about twice length of pedicel; arista brown on basal fifth, yellow on subbasal fifth, brown on apical three-fifths; rays brownish black. Measurements in micrometer units: head width, 230; width of vertex, 58, of frons at base of antenna, 97; width of frontale at maximum, 38 (comparative width of parafrontal at same place, 20), at antennal base, 35, at anterior ocellus, 25; distance between vibrissae, 45; vibrissa to oral margin, 20; oral margin to lower margin of lunule, 80; width of parafacial at cheek groove, 20; width of gena, 38; eye height, 145; antennae separated by 7; length of pedicel, 17, of flagellum, 32.

Thorax and abdomen black, with dull purplish reflections dorsally and on abdomen ventrally, purplish to greenish on thoracic pleura; pollen cinereous, of moderate density, less dense on apical part of scutellum, mesopleuron and pteropleuron anterior to wing base and squamae, base of abdomen, and apical transverse bands on abdominal terga 2 to 4; pollen best visible from posterior view, but distinctly dulling background except in sparser areas indicated above; that of abdomen only indistinctly tessellated. Mesonotum, viewed from behind, with traces of three vittae (a pair of dorsocentrals, one between acrostichal rows); a lateral

vitta below postsutural supra-alars and extending onto postalar callus, subshining. Setulae of mesonotum, dorsal surface of scutellum, humerus except below, mesopleuron, and abdomen except first and second sterna black; postalar declivity with a few scattered, yellowish to brownish, as well as blackish, hairs ventrally; posterior mesopleural fringe mixed black and yellow; hairs of humerus below level of top of anterior spiracle, sternopleuron, hypopleuron, prosternum, and first and second abdominal sterna whitish to yellowish, those of first abdominal sternum long. Coverings of anterior and posterior spiracles black. Acrostichals, 1, 3; postsuturals located on posterior half of postscutum and continued forward by a row of about three setulae that are stronger than the others; dorsocentrals, 2, 6; humerals, 3; accessory propleural and accessory stigmatal present; pteropleurals, about 10, of equal length but not of equal strength, forming a tuft; scutellars, 3 lateral, 1 discal; abdominal bristles weak, a transverse row of median discals on fourth tergum; 1 pair apicals on second sternum.

Femora black with a weak greenish reflection; tibiae reddish brown; basitarsi mostly reddish brown, remainder of tarsi blackish brown. Middle tibia with strong, long ventral at about two-thirds length. Wing yellowish hyaline, broadly brown apically, including area beyond basal third of apical cell, and basally, basad of furcation of R_5 ; basicosta black; bend of M_1 rounded, part beyond bend sinuate. Halteres yellow. Squamae yellow, deeper so along margins; fringes pale yellow to white. Length, 10 mm.

MALE.—Unknown.

HOLOTYPE.—♀, Thailand (Siam), Kuong Pen., Kao Chong, 1,000 feet, July 1933, Hugh M. Smith; USNM 70751.

REMARKS.—This species belongs in the *viridaurea* group as defined by Peris (1952), and, with the present state of our knowledge, there is no reason to place it elsewhere. Superficially, it resembles *I. tristis* (Bigot) and its relatives. The black coloration of the thorax and abdomen distinguish it from all other Oriental members of the genus known to me; the tuft of pteropleurals and (except for the next species) the setulae on the lunule are distinctive.

Isomyia chalconotum, new species

FEMALE.—Head mostly black; gena mostly brownish yellow to brown, becoming clearly yellow posteriorly and along oral margin; cheek grooves pale reddish

brown; postgena black; frontale dark reddish brown; lunule orange-yellow; face yellow; facials grading from yellow to color of cheek groove and becoming somewhat darker next to parafacials. Ocellar triangle, parafrontals, parafacials, genae, cheek grooves, and occiput, except glabrous area, densely golden pollinose, color deepest on genae, pollen densest on occipital orbits; a small subshining spot on gena below eye; pollen of frontale concolorous with background; lunule appearing glabrous but, when viewed posteriorly, with golden pollen except on anterior margin; face more lightly dusted with whitish pollen but its entire surface dulled. Frontale about 1.3 to 1.4 times as wide as parafrontal, gradually widening from anterior ocellus to antennal base. Bristles, setulae, and hairs of head mostly black; a few posterior bristles of oral row, also hairs and setulae on posterior part of gena and lower part of occiput, yellow to golden. Frontals, 9 to 13; parafrontal and parafacial setulae short, latter in one or two irregular rows. Several black setulae on lunule. Antennae orange, flagellum somewhat brownish above; arista brown, a subbasal area yellow. Measurements in micrometer units: head width, 280; width of vertex, 60, of frons at base of antenna, 100; width of frontale and parafrontal at base of antenna, 40 and 30, at anterior ocellus, 27 and 17; distance between vibrissae, 60; vibrissa to oral margin, 35; oral margin to lower margin of lunule, 115; parafacial at cheek groove, 20; width of gena, 42; eye height, 175; antennae separated at base by 9; length of pedicel, 22, of flagellum, 32.

Thorax green, but over most of its area so strongly coppery in reflections as to obscure background except under special lighting; green color shows best on humeral slopes, postalar callus, margin of scutellum, notopleuron and hypopleuron; pollen cinereous, that of dorsal surface scant, more conspicuous anteriorly on mesonotum, rather dense on lower part of humerus, propleuron, lower anterior margin of mesopleuron, most of sternopleuron, and posterior part of pteropleuron. Setulae of mesonotum, upper part of humerus, dorsum and sides of scutellum, and upper anterior margin of mesopleuron black, mesopleural black setulae about 10 in number, in about two rows next to notopleural suture. Pleural hairs, including those of lower half of humerus, golden to yellow; posterior mesopleural fringe golden. Some yellowish hairs on ventral side of scutellum and on postalar declivity. Covering of anterior spiracle yellow, that of posterior spiracle brown. Thoracic bristles black; acrostichals, 2, 4; dorsocentral, 2, 4; humerals, 3-4; pteropleural,

1; an accessory propleural but no accessory stigmal; scutellars, 3 lateral, 1 discal.

Femora black, with green and bronze reflections. Tibiae and tarsi reddish yellow, tarsi becoming darker beyond apex of basitarsus. Coxae and femora with cinereous pollen. Bristles and setulae of legs black. Middle tibia with strong ventral at about two-thirds length. Wing wholly brown; basicosta bright yellow; M_1 strongly bent but not angulate. Halteres, squamae, and their hairs deep golden.

Abdomen blue-green (first tergum) or purple (second and third terga) dorsally, without apparent pale pollen, though some can be seen at a very oblique angle; fourth tergum, in strong contrast, densely cinereous pollinose, pollen obscuring background over most of tergum regardless of light incidence; background quite evidently green at base of fourth tergum, apparently purplish elsewhere. Apices of second and third terga black banded. Ventral slopes of terga concolorous laterally with dorsal surfaces but second to fourth largely coppery; on second and third terga ventral surfaces merge from purple to green to copper. Ventral faces of abdominal terga with conspicuous cinereous pollen over much of surface, but not as dense on fourth as dorsally. Hairs and setulae mostly black; those on first and second sterna golden; considerable golden hair on first tergum ventrally. Median discals of fourth tergum in a very irregular row near base of tergum; second sternum with a pair of strong black apicals. Length, 12 mm.

MALE.—Eyes separated at narrowest by about 0.035 head width, or by little more than diameter of anterior ocellus, yet frontale narrowly visible throughout. Frontals, 14 or 15, uppermost reclinate, ascending a little more than half way to ocellar triangle. Thorax bright green, coppery reflections present in places but noticeable only in certain lights. Pollen of mesonotum and scutellum more noticeable than in female. Pteropleurals, 2. Pile of mesopleuron, except lowermost part, and a few hairs on sternopleuron black. Middle tibia without ventrals except apically. First three abdominal terga as in female but purple areas more extensive; fourth tergum showing same contrast with preceding ones as in female, but background, which varies from blue-green to purple, shows through more clearly; hypopygium in contrast shining, pollen visible only obliquely. Median discals of fourth tergum in a much-better-ordered row and longer and stronger than in female. Genitalia as in Figure 1a; inner forceps (cerci) unusually narrow when viewed dorsally.

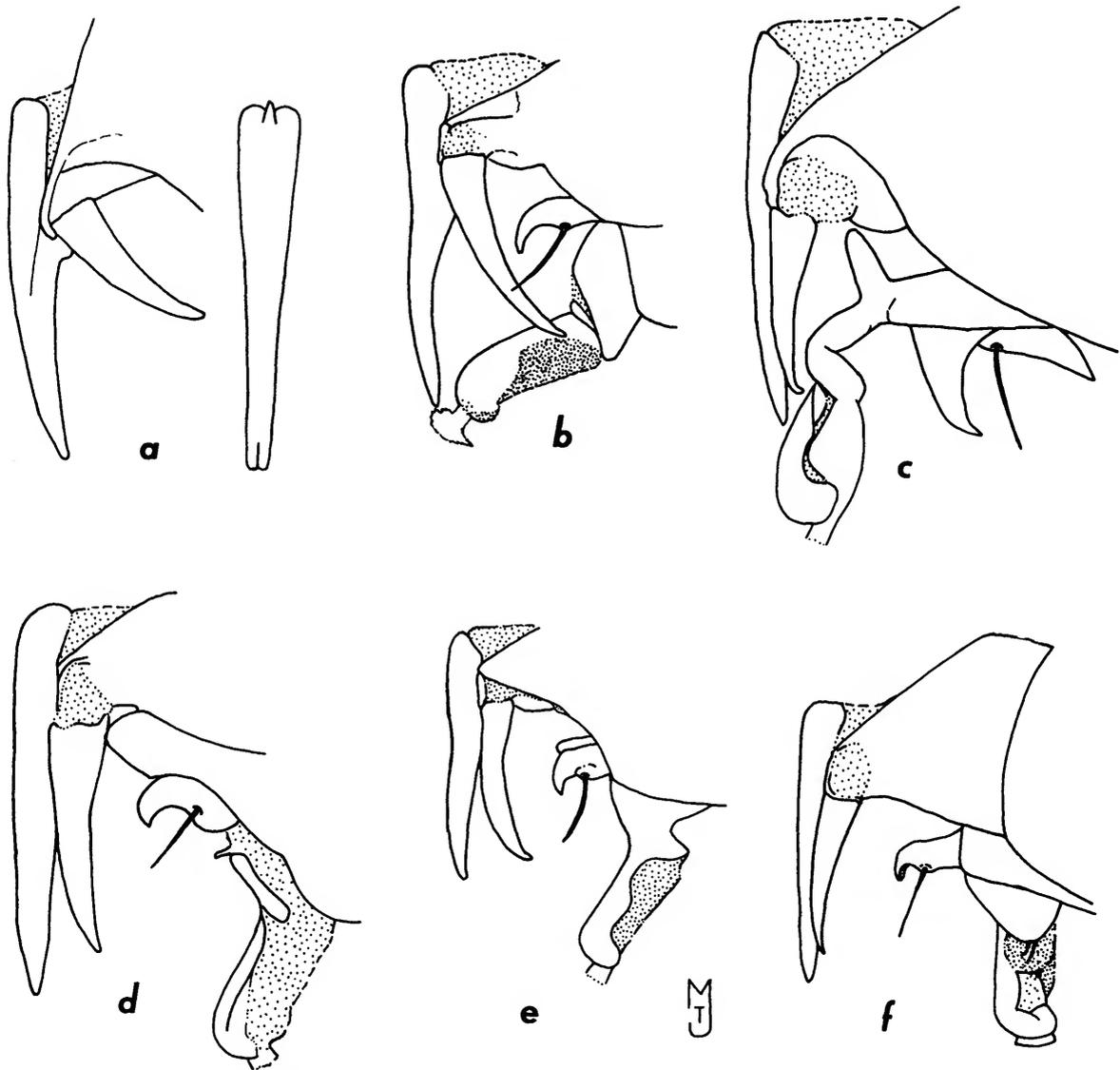


FIGURE 1.—Male genitalia, lateral view in all figures, also dorsal view of inner forceps in *Isomyia chalconotum*: a, *I. chalconotum*, new species, from paratype; b, *I. viridaurea* (Wiedemann), from Bangkok, Thailand; c, *I. gomezmenori* (Peris), topotypical; d, *I. perisi*, new species, from holotype; e, *I. discalis*, new species, from holotype; f, *I. facialis*, new species, from holotype.

HOLOTYPE.—♀, Malaysia (Federated Malay States), Pahang, Fraser's Hill, 4,200 feet, 19 July 1936, H. M. Pendlebury; British Museum (Natural History).

ALLOTYPE.—♂, Malaysia, Perak, Larut Hills, 3,700 to 4,500 feet, 11 February, H. M. Pendlebury.

PARATYPES.—1♂, 1♀, same data as allotype but collected 11 February and 15 February, respectively.

REMARKS.—This is a well-marked species, separable from other members of this group except the preceding species by the setulose lunule and from all known members of the group by the distinctly tricolored dorsal surface of the thorax and abdomen, the densely pollinose fourth tergum strongly contracting with both the thorax and the rest of the abdomen.

Isomyia marginata, new species

FEMALE.—Parafrontals, parafacials, and occipital orbits apparently black but so densely covered with golden pollen that color of background is virtually not discernible; glabrous area of occiput mostly yellow, paracranialia and broad borders of occiput brownish black, latter becoming black on lower occiput and postgena, these areas but moderately pollinose; gena and oral margin yellow with dense golden pollen which, however, becomes sparse on a subshining brown patch on gena below eye; facialia, cheek grooves, and face yellow, latter brownish yellow on upper half; face with light yellow pollen which, however, dulls its entire surface; frontale reddish yellow, dulled by concolorous pollen; lunule yellow, glabrous. Head bristles black; frontals, 9 or 10. Setulae of occipital orbit, parafacials, and most of gena short, black; those of parafacials and parafacials numerous, latter finer in texture and in three or four irregular rows. Hairs of occiput and lower part of gena yellow, latter long. Frontale apparently tapering gradually from ocellar triangle to lunule, in type somewhat withdrawn below so that its exact width is difficult to determine. Antennae orange-yellow, flagellum largely brown except at base below; flagellum about twice length of pedicel; arista reddish brown, yellow on a subbasal band. Measurements in micrometer units: head width, 265; width of vertex, 60, of frons at base of antenna estimated at 90, of frontale at base of antenna estimated at 27, of frontale at anterior ocellus estimated at 35; distance between vibrissae, 55; vibrissa to oral margin, 30; oral margin to lower margin of lunule, 110; width of parafacial at antennal base, 35, at cheek groove, 22;

width of gena, 55; eye height, 180; antennae separated by 10; length of pedicel, 20, of flagellum, 40.

Mesonotum deep green-purple; a narrow longitudinal green vitta just inside each dorsocentral row, bare of setulae, extending from anterior margin of mesonotum to middle of postscutum; poorly defined green areas along suture and on disc of mesonotum, both presuturally and postsuturally, but mesonotum predominantly purple and appearing to naked eye as almost uniformly so; scutellum purple dorsally and on sides; humerus purple above, green below; pleura predominantly green but with indefinite purple areas on sternopleuron and on anterior part of mesopleuron and pteropleuron. Mesonotum and scutellum with light gray tomentum, visible posteriorly, thickest on anterior margin of mesonotum; scutellum ventrally densely whitish pollinose on about median half, dull velvety black laterally; pollen of pleura mostly cinereous, dense on lower part of humerus, propleura, around anterior spiracle, less so on extreme lower margin of mesopleuron except anterior slope, posterior part of pteropleuron, and around posterior spiracle; visible elsewhere only in proper light. Some long hairs basally and short pubescence elsewhere on postalar declivity; scutellum with rather abundant but short, fine, inconspicuous yellow hairs ventrally. Covering of anterior spiracle bright yellow, of posterior one brown. Bristles of thorax and setulae of mesonotum, scutellum, upper parts of humerus, and upper anterior margin of mesopleuron black; hairs of pleura yellow; posterior mesopleural fringe light golden. Acrostichals, apparently 2, 3 (or 2, 4; postsutural acrostichals all on posterior half of postscutum and an additional one may be obliterated by the pin); dorsocentrals, 2, 4; humerals, 3; pteropleurals, 2; scutellars, 3 lateral, 1 discal; an accessory propleural, no accessory stigmatal.

Femora partly black, partly strongly metallic; front femur strongly metallic in part, ranging from purple dorsally to purplish blue ventrally and bluish green on basal half anteriorly; middle and hind femora in part purplish posteriorly and blue-green on part of anterior surface; tibiae yellowish brown; tarsi brown; bristles and hairs black. Middle tibia with strong ventral at two-third length. Wing hyaline; bend of M_1 angular, with a slight spur; basicosta brown broadly along margin, otherwise yellowish brown. Halteres yellow, stalk somewhat reddish yellow; squamae and hairs yellow, thoracic squama with tinge of brown posteriorly except along posterior rim.

Abdomen purple dorsally; first tergum basally, broad apices of second and third terga and a narrow median vitta black; overall appearance to naked eye purple; some green on fourth tergum, at apex, medially, and on sides of second to fourth terga, at base of dorsal surface; ventral aspect of terga merging into green, considerably so on first, some bronzing on third; pollen cinereous, invisible except when viewed from behind on first three terga dorsally, most conspicuous there on extreme anterior margins, more conspicuous on fourth tergum, where pattern is tessellated; ventrally conspicuous on first and median basal parts of second to fourth, also on first sternum and, a little less so, on second, visible elsewhere, as on dorsum, only in the proper lighting. Bristles and setulae black; hairs on ventral aspect of first tergum, anterior to lateral bristles, and on sterna fine, pale, yellow to whitish. An indefinite row of median discals on fourth tergum; second sternum with one pair of strong, black apicals. Length, 12 mm.

MALE.—Unknown.

HOLOTYPE.—♀, Philippine Islands, Mindanao, Kolumbugan; Baker; USNM 70752.

Isomyia chrysoides (Walker)

I have seen 6 ♂♂ and 7 ♀♀ from the H.M. Pendlebury Collection, now in the British Museum (Natural History), from the following localities in Malaysia: Pahang (Fraser's Hill, 4,000 ft., 25 January 1929; Kuala Taku, about 550 ft., 5 December 1921); Perak (Batang Padang, Jor Camp, 1,800–2,000 ft., 29 May 1923, 4 June 1923, and 20 August 1922; Larut Hills, 3,700–4,600 ft., 15 February 1932); Kuala Lumpur, 19 July 1933; and Selangor (Bukit Kutu, 3,450–3,500 ft., 18 and 19 April 1926, September 1915, 2 September 1929, and 22 September 1932).

Isomyia viridaurea (Wiedemann)

Musca viridaurea Wiedemann, 1830, p. 397.

Thelychaeta chalybea Brauer and Bergenstamm, 1891, p. 391.

This is a common species that is distributed over a large part of the eastern Oriental Region. A more complete synonymy is given by Peris (1952). I have seen specimens from Taiwan (as Formosa), Viet Nam (as Indochina), Thailand (as Siam), Malaysia (Pahang, Kedah, Kuala Lumpur), Java, Sumatra, Borneo, Bali, and the Philippine Islands; and Peris has recorded it, in addition, from Assam and Burma.

The name *viridaurea* is aptly descriptive; the fly is usually golden-green in overall appearance, though some specimens will take on a bluish cast. The dense pollen, especially of the abdomen and sternopleuron, the yellow hairs of the thoracic pleura and ventral aspect of the abdomen, the yellow basicosta, and the yellow covering of the anterior spiracle are good recognition marks. The black setulae below the notopleural suture are usually arranged in two longitudinal rows and contrast strongly with the pile. The second sternum is clothed with yellow hairs, some of which are long and bristle-like; there is one pair of apical, black bristles. Male genitalia as in Figure 1*b*.

Musca viridaurea was described from an unstated number of females from Java (no other data) "In Westermann's und meiner Sammlung." According to Zimsen (1954), there is one specimen in the Zoological Museum in Copenhagen. There is one female in the Natural History Museum in Vienna with the labels "*Java*," "*Wd. viridaurea* Coll. Winthem," and "*Musca viridaurea* Wied." (Italics here refer to handwritten labels, the others being printed.) The last label is in a different and apparently more recent hand, and this may be the female stated to be in Westermann's collection since it has a red type label; however, no mention of the Winthem collection is made by Wiedemann. If a lectotype is to be designated, it should be from the Copenhagen Museum, since that is the collection from which the specimens originally came.

Thelychaeta chalybea, from the description, was based on both sexes; the only locality given is "Borneo"; no date, collector, or other information is given. Three specimens in the Vienna collection have red type labels. There are two females with the labels "F. Baczas/ 1886/ Borneo" and "*chalybea*/ det. B. B." One of these has an additional label, written in a different and apparently more recent hand: "*Thelychaeta chalybea* Br. Bgst." I am designating this specimen the lectotype, the other a paralectotype. The only male has the labels "*Sumatra*" and "*chalybea*/ det. B. B." Probably this male was the one referred to this species by Brauer and Bergenstamm, but this is simply a conjecture, since no Sumatra locality was given.

Isomyia gomezmenori (Peris), new combination

Thelychaeta gomez-menori Peris, 1951, p. 246.

The male genitalia (Figure 1*c*) differ considerably from those of other members of this group that I have

studied. A topotypical series of 3 ♂♂ and 4 ♀♀ from India, Uttar Pradesh, Mussoorie, 5,000–6,400 feet, 15–18 May 1962, and 1 ♀, Chakrata, 6,700 feet, all collected by J. R. Donahue and in the collection of Michigan State University.

***Isomyia pichoni* Séguy**

I have seen only the male, referred to this species by Peris (1956).

***Isomyia pseudolucilia* (Malloch), new combination**

Strongyloneura pseudolucilia Malloch, 1928, p. 483.

One female—North Viet Nam (Tonkin), Montes Mauson, 2,000–3,000 feet, April–May, H. Fruhstorfer, Natural History Museum of Vienna—was determined as this species by Malloch and seems to belong here. Dr. Raymond Gagné studied the type and kindly furnished me with information necessary for placing it in my key (number and arrangement of scutellar bristles, color of pleural pile).

***Isomyia ceballosi* (Peris), new combination**

Thelychaeta ceballosi Peris, 1951, p. 246.

Described by Peris from a series from Borneo and Burma. I am referring here 1 ♀, Borneo, Lebang-Hara, 1–7 January 1925, H. Winkler; Hamburg Museum.

***Isomyia aurifacies*, new species**

FEMALE.—Parafrontals, ocellar triangle, and occiput, black; frontale brownish black; parafacials and cheek groove reddish brown, a black area occupying a considerable part of lower parafacial; gena reddish yellow, lunule and face more clearly yellow. Occipital orbits, parafrontals, parafacials, facialia, genae, lunule, and upper facial carina with golden yellow pollen, almost uniform but somewhat deeper in color on parafacials; pollen of face and occiput other than orbits yellow to pale yellow; lunule entirely pollinose. Bristles and hairs of head black except those of occiput, which are pale yellow above to mixed yellow and golden below. Setulae of parafacials in about three irregular rows. Frons gradually widening from vertex to antennal base; frontale widest at two-

fifths distance from vertex to antennal bases. Antennae orange, flagellum somewhat brownish externally above; setulae black; arista orange, becoming brown at apex, rays mostly brown. Measurements in micrometer units: head width, 310; width of vertex, 90, of frons at base of antennae, 120, of frontale at maximum, 50, of parafrontal at same place, 26, of frontale and parafrontal at antennal base, 37 and 42; distance between vibrissae, 67; vibrissa to oral margin, 30; oral margin to lower margin of lunule, 105; parafacial at cheek groove, 29; width of gena, 48; eye height, 195; antennae separated by 9; length of pedicel, 18, of flagellum, 40.

Thorax green, scutellum more blue-green, with blue to purplish reflections varying with light incidence; mesonotum lightly but evenly cinereous pollinose, pollen visible best as viewed from behind, most noticeable along anterior margin of mesonotum; pollen of pleura scant except on lower part of sternopleuron. Posterior fringe of mesopleuron and softer hairs of pteropleuron brownish black, otherwise bristles, setulae, and hairs of thorax black. Distinct narrow vittae between acrostichal and dorsocentral rows from anterior margin of mesonotum to about two-fifths way between suture and scutellum, also postsutural vittae between dorsocentral and intra-alar rows and a triangular area behind post-humerals, devoid of setulae. Mesopleural pile only moderately long and dense. Posterior declivity with some black setulae. Coverings of anterior and posterior spiracles blackish brown. Acrostichals, 1, 2; dorsocentrals, 2, 4; humerals, 4; pteropleural, 1 plus 1 accessory; scutellars, 4 lateral, 2 discal; 1 accessory propleural and 1 accessory stigmal.

Coxae and femora largely black; front coxa anteriorly, middle coxa in large part, front femur posteriorly on basal two-thirds, middle femur posteroventrally on basal half, and a ventral area at base of hind femur metallic green. Tibiae and basitarsi reddish yellow, front basitarsus above and other tarsomeres becoming brownish black. Middle tibia with strong ventral at three-fifths length. Wing yellowish, veins golden, more brownish toward base on lower surface; basicosta black; M_1 broadly rounded at bend but bent at almost a right angle, strongly concave beyond bend; squamae uniformly brown.

Abdomen blue-green; first tergum largely with purplish reflections, especially ventrally; second to fourth terga with black posterior margins, broader ventrally than dorsally, and with a rather indistinct median vitta. Pale pollen cinereous, scant dorsally, visible at

an angle at sides of second and third terga, much more prominent ventrally, a dense spot on first under squamae, otherwise densest toward midventral margins of first to fourth terga; second sternum with dense cinereous pollen. Hairs, bristles, and setulae mostly black; second sternum basally with brownish yellow hairs, otherwise with black setulae and about five pairs of black bristles; an irregular discal row at about one-third of fourth tergum dorsally. Length, 12 mm.

MALE.—Unknown.

HOLOTYPE.—♀, India, Assam, 10 miles north of Tinsukia, 11 April 1944, D. E. Hardy; USNM 70753.

Isomyia perisi, new species

MALE.—Head largely black. Gena, cheek groove, lower outer part of faciale, and lunule reddish brown, face and rest of faciale reddish yellow; middle of gena rather indefinitely brownish; pollen of parafrontals, parafacials, and occiput cinereous, that of faciale, parafacial, cheek groove, and gena concolorous with background; lunule with clearly evident yellowish pollen, visible from any angle, on more than its posterior half. Occiput with long yellow hairs medially, most conspicuous below glabrous area of upper occiput but also visible back of proboscis, other hairs, setulae, and bristles of head black. Frontals about 12, upper ones becoming size of larger setulae; setulae abundant on parafrontals and parafacials; lunule without setulae. Width of frons at narrowest little more than diameter of anterior ocellus, frontale completely obliterated at narrowest. Antennal scape and pedicel reddish brown, flagellum reddish yellow, brown above except at base. Arista reddish brown to brown, subbasal third yellow; rays brown. Measurements in micrometer units: head width, 310; width of frons at minimum, 8, at vertex, 30; distance between vibrissae, 62; vibrissa to oral margin, 45; oral margin to lower margin of lunule, 130; parafacial at antennal base, 20, at cheek groove, 32; width of gena, 70; eye height, 210; antennae separated by 10; length of pedicel, 20, of flagellum, 40.

Thorax blue-green with purplish reflections, especially laterally; pollen brownish gray, clearly evident from posterior view over most of mesonotum, scant on scutellum, lacking or scant on most pleural areas, most evident there on part of the sternopleuron; darker pollen resulting in a pair of narrow presutural vittae between acrostichal and dorsocentral rows; hairs, setulae, and bristles mostly black, some around ante-

rior spiracle and posterior mesopleural fringe dark brown. Coverings of anterior spiracle brownish black, that of posterior black. Acrostichals, 2, 3, anterior presutural and postsutural much weaker than others; dorsocentrals, 2, 4; scutellars, 4 lateral, 1 or 2 discal; pteropleural, 1, surrounded by setulae as long as the bristle, some of them almost bristle-like; 1 accessory propleural, no accessory stigmatal.

Coxae and femora black, anterior pair with strong blue-green reflections, coxa anteriorly and femur posteriorly virtually blue-green, others with traces of such; tibiae and basitarsi reddish brown to brown, anterior pair palest; trochanters and tarsi beyond basitarsi black. Middle tibia without median ventral. Wing pale brown, almost hyaline; bend of M_1 pronounced, forming approximately a 100° angle, but rounded at bend. Basicosta black; halteres reddish yellow; squamae wholly dark brown.

Abdomen bluish green. Pollen scant except on second sternum and inner half of ventral areas of second and third terga, where it is dense and cinereous. First abdominal tergum and posterior margins of second and third, also a broad median vitta dorsally on second and a narrow one on third, black, with purple reflections; ventral sides of first three terga with strong violet reflections, fourth less so; black areas of posterior margins of second and third much more broadly developed ventrally than dorsally. Fourth tergum well set (except on basal third) with discals, not arranged in rows. Second sternum with about eight pairs of bristles, but with no stronger apical pair, and with long yellowish hairs; bristles, setulae, and hairs of abdomen black, unless otherwise noted. Genitalia as in Figure 1d. Length, 13 mm.

FEMALE.—Frontale brownish black. Pollen of parafrontals and parafacials variable in color, usually brownish to yellowish brown, darker on parafrontals than on parafacials, sometimes mostly cinereous as in the male. Pale hairs of upper occiput not as long or as deep yellow as in male. Measurements in micrometer units: head width, 310; width of vertex, 90, of frons at base of antennae, 125, of frontale and parafrontal at anterior ocellus, 35 and 25, of same at antennal base 42 and 42, of parafacial at cheek groove, 30. Frons gradually broadening from anterior ocellus to base of antennae. Middle tibia with a strong ventral a little beyond middle. Discals of fourth tergum arranged mostly in a row just anterior to midline of tergum. Length, 13 mm (allotype: range, 12–13 mm).

HOLOTYPE.—♂, South India, Madras, Anamalai Hills, Kadamparai, 3,500 feet, May 1963; P. S. Nathan; USNM 70754.

ALLOTYPE.—♀ same data as holotype.

PARATYPES.—5 ♀ ♀, same data; 5 ♀ ♀, same data but Anamalai Hills, Cinchona, May 1964; 1 ♀, same data but Cinchona, September 1964.

REMARKS.—This new species may be the species discussed by Peris (1952, p. 165) as "Th. sp.?" and referred by him to the *delectans* complex, which he thought consisted of more than one species but which he was unable to resolve. Like *I. ceballosi* (Peris), *I. pseudolucilia* (Malloch), and *I. aurifacies*, new species, this new species has four marginal scutellars which are, however, not equidistant from one another, the distance between the basal one and the next in line being the greatest. The species of this complex are all large and robust, and the second sternum, which is broader than usual for the *viridaurea* group, is set with a number of black bristles rather than with only the usual strong apical pair.

I take pleasure in dedicating this species to Dr. S. V. Peris, who has done so much toward elucidating our knowledge of the Rhiniinae.

Isomyia iris, new species

MALE.—Occiput, ocellar triangle, frons, parafacials, and a large area on anterior part of gena black; face yellow, facials, cheek groove, rest of gena, and lunule orange to orange-yellow; pollen cinereous, densest on parafrontals, parafacials, and occipital orbits, becoming golden on cheek groove, much of gena, and face, only moderately dense on gena, the entire ground color showing through; frontalia on upper half golden pollinose; lunule apparently shining, yet when viewed from behind upper part distinctly yellow-pollinose. Bristles, hair and setulae black to blackish brown, those of occiput yellowish, becoming yellowish brown to brown below; setulate of parafacials moderately long, in two fairly well defined rows. Frontals, 8 or 9, row continued with a few setulae above to a point about half way from antennal base to ocelli; lunule without setulae. Width of frons at narrowest area less than diameter of anterior ocellus, frontale completely obliterated at narrowest. Antenna orange, flagellum largely yellow, upper surface brown; arista orange at base, then yellow, becoming brown on apical half; rays brown. Measurements in microm-

eter units: head width 275; width of frons at minimum, 4, at vertex, 30; distance between vibrissae, 55; vibrissae to oral margin 35; oral margin to lower margin of lunule, 105; parafacial at antennal base, 15, at cheek groove, 17; width of gena 45; eye height 195; antennae separated by 8; length of pedicel 20, of flagellum, 43.

Mesonotum black centrally, with dull bronze reflections when seen through pollen; broad sides and prescutellar area deep metallic blue-green, more of a deep green in supra-alar area and in front of scutellum, deep blue to purple elsewhere; central part of prescutellar green area forming a triangle from postalar callus almost to suture, where it is continued by a vitta between acrostichal rows to anterior presutural acrostichal; dorsocentrals set on a narrow purple vitta with violet reflections; black areas strongly cinereous pollinose, as viewed from behind, leaving a narrow black vitta between each acrostichal and dorsocentral row and a large triangular area between dorsocentral row and posthumeral without pale pollen; areas of contact between black and metallic areas merging in proper light from green to deep blue to purple to violet (this suggests the name *iris*, "rainbow"). Scutellum and pleura deep blue with purplish reflections; under side of scutellum cinereous pollinose on median third; pollen elsewhere cinereous to brown, generally not conspicuous except on sternopleuron. All thoracic bristles, setulae, and most hairs black to brownish black; hairs of mesopleuron especially long and dense, especially on upper part, where they tend to obscure the usual black setulae; these hairs appear brownish under certain lights; posterior mesopleural fringe brown; some black erect hairs on posterior declivity and under sides of scutellum. Covering of anterior and posterior spiracles deep brown. Acrostichals, 2, 3, anterior postsutural weak; dorsocentrals, 2, 4; scutellars, 3 lateral 1 discal; humerals 3; pteropleural, 1; no accessory propleural or stigmatal.

Legs black, with black setulae and bristles; front femur with strong purplish reflections, almost appearing purple, posteriorly and on basal part anteriorly, other femora with limited purplish reflections posteriorly; tibiae more brownish black, front tibia in places yellowish brown. Middle tibia without a ventral. Wing almost hyaline, very slightly brownish; bend of M_1 abrupt but not angular. Basicosta brown to dark brown, darker anteriorly. Halteres yellow. Squamae wholly and uniformly brown except rim yellowish.

Abdomen deep blue with strong purple reflections; basal part of first tergum dorsally and broad apices of second and third, also a median vitta on first three, black; ventral aspects of second and third becoming bronze medially. Pollen of dorsal surface inconspicuous, visible as thin cinereous pollen when viewed posteriorly; that of ventral surface much more apparent, dense on first tergum and toward inner margins of second and third, where it forms tessellated patterns. First sternum apparently black, second purple, densely cinereous pollinose. Bristles and setulae mostly black; hairs of first and second sterna white, but second also, in addition to apical bristles, with numerous strong black setulae that appear as fine bristles. Genitalia not dissected. Length, 11 mm.

FEMALE.—Unknown.

HOLOTYPE.—♂, Philippine Islands, Mindanao, Zamboanga; Baker; USNM 70767.

Isomyia discalis, new species

MALE.—Occiput, ocellar triangle, frons, parafacials, and postgena black; lunule orange; face yellow; facials, cheek groove, and gena yellow to yellowish brown, gena with a large indefinite blackish spot anteriorly. Ocellar triangle and occiput with thick whitish pollen; parafacials and genae with thick yellowish pollen, obscuring ground color except on part of the black spot of the gena, which is subshining, and on a small spot on lower part of parafacial; face golden pollinose; frontale dark brown; lunule apparently shining, yet when viewed from behind upper part distinctly yellow pollinose. Hairs of lower occiput, postgena, and posterior part of gena yellow, bristles and setulae of head all black; hairs of parafacials moderately long and abundant, in two or three very irregular rows; eight or nine frontals, row continued with some long setulae to about half way from base of antennae to ocelli; lunule without setulae. Width of frons at narrowest less than diameter of anterior ocellus, frontale there completely obliterated. Antenna orange, flagellum more yellowish below, brownish above; arista reddish brown at base, then yellow, becoming brown on apical half. Measurements in micrometer units: head width, 240; width of frons at minimum, 3, at vertex, 25; distance between vibrissae, 45; vibrissa to oral margin, 30; oral margin to lower margin of lunule, 100; eye height, 175; antennae separated by 7; length of pedicel, 30, of flagellum, 62.

Mesonotum black centrally, opaque to subshining, broadly metallic green laterally and posteriorly, the green presutural area extending forward to third postsutural dorsocentral; a narrow median green vitta between acrostichal rows, interrupting black area but not reaching anterior margin; some deep purplish reflections where black and green areas meet and along suture; scutellum and pleura green, in places with bluish reflections, a median area of hypopleuron purple. Pollen cinereous, thin on mesonotum, scutellum, and most pleural areas, where it is visible only posteriorly, more evident on sternopleuron. All bristles and most setulae black; abundant black hairs on upper part of mesopleuron in addition to usual black setulae; lowermost hairs of humerus yellow, others black; most hairs of mesopleuron black, a few below yellow, posterior mesopleural fringe golden; sternopleuron with hairs on anterior half black, otherwise yellow; other pleural hairs mostly yellow. Posterior declivity with some short brownish hairs. Underside of scutellum densely whitish pollinose medially, opaque black on sides; a few scattered yellowish hairs scattered over ventral surface. Covering of anterior spiracle brown, of posterior dark brown. Acrostichals, apparently 2, 5, posterior presutural and posterior two postsuturals much the strongest; four postsuturals visible in type, apparently a fifth (the third of the series) obliterated by the pin; dorsocentrals, 2, 4; scutellars, 3 lateral, 1 discal; humerals, 3; pteropleural, 1; an accessory propleural but no accessory stigmatal.

Legs black, with black hairs and bristles; basitarsi with somewhat of a reddish tinge; femora with a greenish reflection on part of anterior surface, front femur also with similar reflection posteriorly. Middle tibia with small but distinct ventral at two-thirds length. Wing uniformly light brown; bend of M_1 broadly rounded, not angulate, part beyond bend lightly sinuate. Basicosta yellow, somewhat brownish inwardly. Halteres orange. Squamae brown, rim and fringe yellow; outer half of thoracic squama white.

Abdomen basically green, fourth tergum with golden-green reflection; actually much of dorsal surface is black, including all of first tergum, second tergum except laterobasal angles, and posterior margins and median vitta on third and fourth, both broader on third than on fourth; terga ventrally with black posterior markings on second to fourth segments, about half length of segment on second and third, narrow

on fourth; first sternum brownish, second green; green areas of abdomen mostly with dense whitish pollen which, in proper light, completely obscures background; pattern on fourth tergum clearly tessellated. Bristles, setulae, and hairs mostly black; first and second sterna, and most of ventral aspect of first tergum, with whitish to yellowish hairs, those of second sternum long; second sternum with one pair of strong apical bristles. Genitalia as in Figure 1e. Length, 10.5 mm.

FEMALE.—Unknown.

HOLOTYPE.—♂, Philippine Islands, Biliran; Baker; USNM 70768.

REMARKS.—This is a well-marked species, separable from all others in the group known to me (except the preceding species) by the thoracic coloration. It is unfortunate that females of both these species are unavailable. Malloch had obviously recognized this species as distinct and undescribed and had placed the label "discalis" on the type specimen but had not described it.

Isomyia delectans (Walker)

Walker's type was from Celebes. The only other specimens that I can refer to this species with reasonable certainty also come from that island: 2 ♀ ♀, South Celebes, Samanga, November 1895, H. Fruhstorfer, National History Museum of Vienna; 2 ♂ ♂ 1 ♀, North Celebes, Tondano, 25 May 1940, R. G. Wind, Washington State University.

Isomyia borneensis (Peris), new combination

Thelychaeta borneensis Peris, 1951, p. 247.

This species was described (Peris, 1951) and re-described in more detail (Peris, 1952) from a single female, erroneously stated to be a male in the type citation in the second work. I have seen six specimens which conform with Peris' descriptions for the most part; the femora, described as metallic green or violet, are variable as to the extent of that color; and the abdomen is distinctly pollinose dorsally, at least in large part, if viewed at an angle. New records are: 2 ♂ ♂, 1 ♀, Borneo, Kupat, 7–15, September 1927, British Museum (Natural History); 2 ♀ ♀, Borneo, Bettotan, 18 August 1927, British Museum (Natural History); 1 ♂, Sumatra, Fort de Koch, 920 meters, 1925, E. Jacobson, Amsterdam Museum.

Isomyia spp.

A considerable residue of material, forming, along with *I. delectans*, *I. pictifacies*, and *I. electa*, a part of the *delectans* complex, must await further study after accumulation of more material.

Isomyia facialis, new species

MALE.—Head black; lower part of face from slightly above level of vibrissa, also oral margin, yellow; cheek grooves and lunule reddish brown. Pollen yellowish brown on inner margin of parafacial and on cheek groove, becoming yellow on parafacials, a paler yellow on gena and occiput, a darker brown on parafrontals; yellowish to whitish on face. Lunule clearly pollinose, with a glabrous area above each antennal base. Hairs of occiput whitish above, yellowish below, blackish toward orbits; otherwise all bristles, setulae, and hairs of head black. About eight frontals, row continued by setulae above; setulae of parafrontals sparse, of parafacials sparse and fine but rather long, mostly in one row. Lunule without setulae. Frons at narrowest much less than diameter of anterior ocellus, frontale obliterated there and parafrontals almost so. Antennal scape and pedicel orange; flagellum (based on paratype, missing in holotype) brown above and apically, yellow below. Measurements in micrometer units: head width, 230; width of frons at minimum, 3, at vertex, 25; distance between vibrissae, 44; vibrissa to oral margin, 36; oral margin to lower margin of lunule, 103; parafacial at antennal base, 13, at cheek groove, 17; width of gena, 35; eye height, 165; antennae separated by 5; length of pedicel (paratype) 16, of flagellum, 32.

Thorax green, more blue-green laterally, with bronze reflections on mesonotum except laterally; all hairs, setulae, and bristles dark brownish black to black. Mesonotum and scutellum, except laterally, with grayish pollen visible from posterior view; traces of bronze to black presutural vittae between dorsocentral and acrostichal rows. Pollen of pleura scant. Posterior declivity with hairs much more distinct and abundant than usual in this group; scutellum with black hairs ventrally. Covering of anterior and posterior spiracles dark brown. Acrostichals, 2, 4, postsuturals set close together on posterior half of postscutum; dorosocentrals, 2, 4; scutellars, 3 lateral, 1 discal; humerals, 3 or 4; pteropleural, 1; an accessory propleural but no accessory stigmalata.

Coxae and femora black, coxae anteriorly and femora anteroventrally partly metallic green, more extensively with metallic green reflections; tibiae and basitarsi reddish yellow, tarsi presumably becoming darker apically (missing beyond second tarsomere in holotype and all male paratypes); middle tibia without ventrals. Wing hyaline, bend of M_1 broadly rounded, strongly sinuate beyond bend. Basicosta black. Halteres yellow, knob a little darker. Squamae brown; outer basal part of thoracic squama white.

Abdomen green; first tergum largely, second and third terga on apical margins, broader ventrally than dorsally, and on an indefinite median line, black; second and third terga more blue-green ventrally; second to fourth terga dorsally and fourth tergum ventrally with bronze reflections, black areas of second and third terga ventrally with purplish reflections. Second sternum green. Pollen cinereous on dorsal surface, visible from posterior view, clearly evident ventrally on terga except toward sides and on second sternum. Second sternum with yellow hairs and with about three pairs of black bristles, also with a few black setulae; otherwise all abdominal bristles, setulae, and hairs black. An irregular row of dorsals on fourth tergum. Genitalia as in Figure 1*f*. Length, 10 mm (paratypes, 9.0 to 10.0 mm).

FEMALE.—Lower part of gena becoming yellowish toward oral margin. Pollen of head more cinereous, some yellowish on parafacials, more yellowish on gena. Frontale reddish brown, pollen concolorous; widest at about half distance from anterior ocellus to lunule, narrowing gradually above and below. Measurements in micrometer units: head width, 215; width of frons at vertex, 50, at base of antennae, 80, of frontale at broadest and parafrontal at same point, 30 and 17, same at anterior ocellus, 25 and 15, same at base of antenna, 25 and 27. Middle tibia with a strong ventral bristle two-thirds distance from base. Halteres white. Discals of fourth tergum mostly in a transverse row, as in the male. Length, 10 mm.

HOLOTYPE.—♂, Thailand (Siam), Bangkok, H. M. Smith; USNM 70769.

ALLOTYPE.—♀, 4 ♂♂, same data as holotype.

PARATYPES.—2 ♀♀, 4 ♂♂, same data as holotype.

REMARKS.—Unfortunately, no specimen in the series is complete; the antennal flagellum and arista are missing in all but one male and one female paratype and the legs are broken in all specimens. The holotype, in spite of its broken antenna, was chosen as the most complete and representative specimen in the series.

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