Revision of the Clearwing Moth Genus *Osminia* (Lepidoptera: Sesiidae)

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and

THOMAS D. EICHLIN

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ABSTRACT

Duckworth, W. Donald, and Thomas D. Eichlin. Revision of the Clearwing Moth Genus *Osminia* (Lepidoptera: Sesiidae). *Smithsonian Contributions to Zoology*, number 361, 15 pages, 27 figures, 1 map, 1983.—The clearwing moth genus *Osminia* is revised and four new species are described. All species in the genus are reviewed regarding their taxonomic history, known distribution, identity, and morphology. A distribution map, photographs of the adults, drawings of the genitalia, wing venation, and other aspects of the morphology are included.

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Introduction

Beginning with this paper, it is our intention to publish a series of studies on the genera and species of the clearwing moths (Sesiidae) of the Western Hemisphere. This interesting and unique family of Lepidoptera has been recognized as distinct for more than a century and has been the subject of an increasing number of systematic, biological, and biochemical studies in recent years (Heppner and Duckworth, 1981).

Our research on sesiids began in 1971 and has always had as an ultimate goal a faunal analysis of the family for the New World. In order to properly prepare for the orderly gathering and analysis of information at the species-group level, it has been necessary to conduct and publish an array of studies relating to type material and higher classification (Duckworth and Eichlin, 1973, 1974, 1977c, 1978a). In addition, a number of papers have been published which were outgrowths of field work associated with the use of synthetic pheromones for attracting a variety of species of sesiids (Duckworth and Eichlin, 1977a, 1977b, 1978b).

The present paper provides a review of the small, structurally unique genus *Osminia*. Engelhardt (1946), in his monograph of the North American clearwings, recognized the uniqueness of the only species known to him, *ruficornis* Edwards, and established the monobasic genus *Signaphora* based on this species. The present authors discovered that Le Cerf (1917) had described the monobasic genus *Osminia* for its type-species *ferruginea* from Mexico and that *ruficornis* and *ferruginea* were cogeneric. Consequently, the Englehardt genus was synonymized (Duckworth and Eichlin, 1977c:27). Field work conducted in recent years in Arizona and Mexico has provided examples of four new species belonging to this genus, which are herein described.

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W. Donald Duckworth, Department of Entomology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560. Thomas D. Eichlin, Laboratory Services/Entomology, Division of Plant Industry, California Department of Food and Agriculture, Sacramento, California 95814.

(Natural History), London; R.O. Schuster, University of California, Davis; P. Viette, Museum National d'Histoire Naturelle, Paris. Special thanks go to the following for special collecting, which provided much of the original material reported here: K.E. Donahue, J.P. Donahue, R.R. Snelling, Los Angeles County Museum of Natural History; T.P. Friedlander, Texas A & M University, College Station; M.S. Wasbauer, California Department of Food and Agriculture, Sacramento.

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Lastly, our gratitude is extended to D.R. Davis and R.C. Froeschner for critical review of the manuscript and their encouragement and support.

Classification

Osminia is a small and structurally unique genus. Along with the monobasic genus *Calasesia* Beutenmuller, it composes the tribe Osminiini in the subfamily Sesiinae (Duckworth and Eichlin, 1977c). This group is, in our opinion, a specialized offshoot of the genus *Sesia* Fabricius, based mainly on features of the male genitalia, such as the well-developed gnathos and simple scale patches on the valva. *Osminia* also appears to have some affinities with the genus *Melittia* Hübner, such as the large eyes, scale plate beneath the scape of the antenna, and certain features of the male genitalia.

The Neotropical species *Callithia oberthuri* Le Cerf, type-species of the monobasic *Callithia*, exhibits some characteristics similar to those found in species of *Osminia*, such as antennae that lack ventral cilia in both sexes and some features of the male genitalia; however, the wing venation pattern is most like species of the genus *Melittia*. Consequently, proper placement of *Callithia* must await the acquisition of additional material and detailed studies.

Together, the tribes Melittiini, Sesiini, and Osminiini form a complex that is somewhat set apart from the remainder of the subfamily Sesiinae.

Distribution

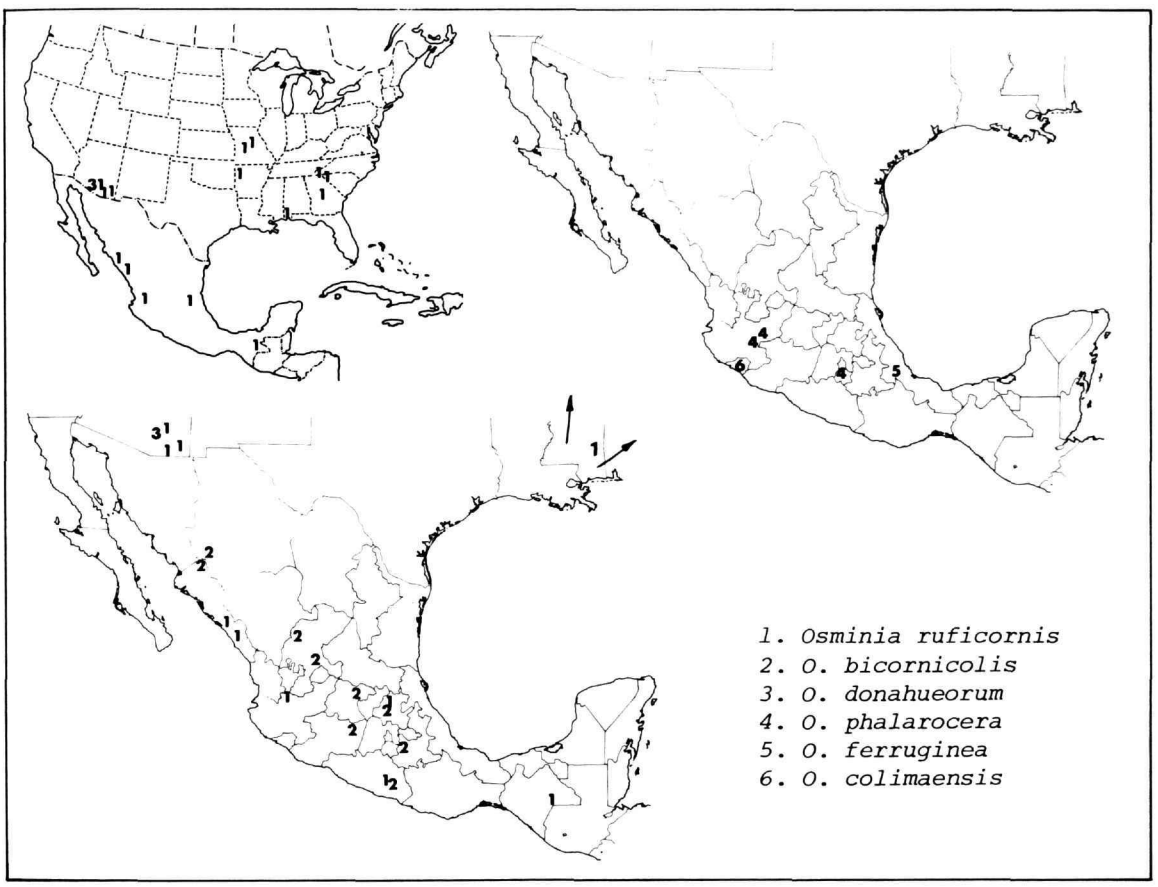
The known distribution for species in the genus *Osminia* is provided in Map 1. While field activities in the southwestern United States and Mexico in recent years coupled with the enhanced collecting capability provided by the advent of sesiid pheromones has greatly improved our knowledge of the occurrence of the species of *Osminia*, the data are still far from adequate. A far more constraining problem is the virtually total lack of life cycle and host-plant information for any of the included species. Consequently, any effort to analyze distribution patterns beyond the most obvious generalities becomes unacceptably speculative at this time.

The currently known distribution for the genus is defined by the range of *O. ruficornis*, which is from Virginia south to Florida, west to Missouri, and from southern Arizona to southern Mexico. The remainder of the species range from southern Arizona to south central Mexico. Thus, the genus appears to be essentially Nearctic in distribution with most of the species occurring in the arid and semiarid areas of the southwestern United States southward to south central Mexico.

Additional observations must, of necessity, await the acquisition of additional specimens and life history information.

Biology

As mentioned previously, virtually no data are known regarding the life histories of the species comprising the genus *Osminia*. In general, sesiids



MAP 1.—Distribution of *Osminia* species.

exhibit great similarity in most aspects of their life cycle (Duckworth and Eichlin, 1974; Heppner and Duckworth, 1981).

There is no reason to assume, at this point, that species of *Osminia* vary from the boring habit typical of all known sesiid larvae. Morphological studies of the adults indicate the normal diurnal adult activity pattern, and collection data report adults of two species (*O. ruficornis*, *O. donahueorum*) feeding in congregations at nectar sources. In the case of *O. donahueorum*, all the specimens were collected at the flowers of a legume (Fabaceae), subsequently determined to be *Cracca edwardsii* Gray. While at the moment this can only be considered an adult feeding record, it may well provide the first substantive clue to the larval host plant, if future field studies result in locating and rearing larval or pupal material.

Checklist

Osminia Le Cerf
- *O. bicornicolis*, new species
- *O. colimaensis*, new species
- *O. donahueorum*, new species
- *O. ferruginea* Le Cerf
- *O. phalarocera*, new species
- *O. ruficornis* (Edwards)

Genus *Osminia* Le Cerf

Osminia Le Cerf, 1917:327 [type-species: *Osminia ferruginea* Le Cerf, 1917, monotypy].

Signaphora Engelhardt, 1946:131 [type-species: *Carmenta ruficornis* Edwards, 1881, original designation].—Duckworth and Eichlin, 1977c:27.

DIAGNOSTIC CHARACTERS.—Head with eyes very large (eye index range: 1.40–1.85) (Powell, 1973:8), extending to vertex behind antennal bases, shortest distance between eyes across vertex less than greatest vertical length of eye, ratios range from 9:10 to 3:10, depending on the species (interocular index, Davis, 1975:5), ocelli very large; vertex roughened, posterior margin with chaetosemae; small scale plate present beneath antenna projecting horizontally slightly over edge of eye; labial palpus roughened, elongate, projecting above front to slightly above highest level of vertex; antenna relatively strongly clavate, one-half to two-thirds length of forewing, lacking ventral cilia on both sexes except very short cilia present on male *O. ferruginea*; proboscis present, normal, not reduced. Forewing with veins R_1 and R_2 confluent for most or part of their length to wing margin; R_4 and R_5 stalked for more than one-half their length. Hindwing with cell very long, extending to about two-thirds of wing length, veins from cell, therefore, relatively short; M_3 and Cu_1 very short stalked. Male genitalia with valva mostly densely clothed with long dark setaceous scales; various spine-like processes, ridges or projections near center of valva, depending on species; without crista sacculi; vinculum relatively wide, with saccus relatively short, wide, broadly rounded apically; gnathos usually well developed, projecting, of various forms depending on species; uncus roof-shaped, thickly clothed with long setaceous scales as on valva; aedeagus narrow, apically with various sclerotization, and with dorsal and/or lateral processes on certain species. Female genitalia with ostium bursae quite different for each species, often complex; ductus bursae usually relatively short, gradually widening to oblong corpus bursae; corpus bursae with signum of various forms, most often a stout, conical, spine-like structure.

DISCUSSION.—The known species of *Osminia* are mainly distributed in Mexico and southeastern Arizona. One species, *O. ruficornis*, occurs from southern Mexico to Virginia.

There are some observations suggesting that one or more of the species may utilize species of Fabaceae (legumes) as hosts. Very little is known about the biology of any of the species of *Osminia*; consequently, the immature stages are not known.

Key to the Species of *Osminia*

1. Abdomen dorsally with one or more yellow or white bands 2
   Abdomen dorsally without yellow or white banding (perhaps with some scattered powdering of pale colored scales) 4
2. Abdomen dorsally with more than one yellow or white band ..... ***O. ruficornis*** (Edwards)
   Abdomen dorsally with one white band 3
3. Abdomen ventrally with white band on segment 4; antenna powdered yellow or orange ..... ***O. donahueorum,*** new species
   Abdomen ventrally unbanded with white; antenna with white or pale yellow spot about one-third from apex ... ***O. phalarocera,*** new species
4. Forewing dorsally strongly powdered pale pink or pale yellow medially before and after discal spot ..... ***O. bicornicolis,*** new species
   Forewing dorsally unpowdered or powdered with rust-red on costal margin and discal spot 5

5. Rust-red on vertex of head, powdered on abdomen dorsally, on anal tuft, and on costal margin and discal spot of forewing dorsally ..... ***O. ferruginea*** Le Cerf

Without rust-red ..... ***O. colimaensis,*** new species

Osminia bicornicolis, new species

FIGURES 6, 12, 18, 20, 23; MAP 1

MEASUREMENTS.—Wing length 7–10 mm. Eye index 1.65–1.70, range for both males and females.

MALE.—*Head:* Vertex roughened, brown-black with many long, thin, white scales mixed; occipital fringe white and brown-black mixed; front brown-black, white laterally, beneath scape and often scattered dorsally and medially; labial palpus strongly roughened with long, thin scales of similar length throughout, brown-black, white and some pale yellow scales mixed; antenna brown-black, unpowdered.

Thorax: Brown-black, pink patch at wing base anteriorly, elsewhere with much pink, white and pale yellow mixed.

Abdomen: Brown-black with some pale yellow and pink variously, strongest laterally and ventrally; anal tuft poorly developed, with much pale yellow.

Legs: Coxae brown-black basally but with much pale pink, pale yellow and white laterally and distally; femora brown-black, ventrally with very long, thin, pale yellow and white scales; tibiae brown-black, distal one-half dorsally with tuft of long, thin pale yellow and white scales, some also ventrad; tarsi pale yellow, brown-black at joints.

Forewing: Mostly opaque with margins, veins and discal spot brown-black, but discal cell, below Cu_1 and apical area pink or pale yellow, these scales apparently easily lost, leaving hyaline areas.

Hindwing: Hyaline with very narrow, brown-black margins; fringe white on anal margin to wing base.

Male Genitalia (Figure 18): Valva strongly upcurved distally, outer margin somewhat concave; medial projection on valva latero-apically; aedeagus with narrow, elongate, sinuous, sharply pointed, lateral processes.

FEMALE.—Similar to the male.

Female Genitalia (Figure 20): Region of ostium bursae complex, with large, blind, sac-like structure ventrad: posterior portion of ductus bursae mostly sclerotized except ventrally, remainder short, membranous; corpus bursae oblong, signum uniquely in form of sclerotized, pigmented patch with thin medial plate projecting into corpus bursae.

TYPES.—*Holotype* (male): "9 mi. north Ojo Caliente, Zac., MEX., V-12-1962"; "F.D. Parker, collector" (deposited at University of California, Davis).

Paratypes (133: 128 males, 5 females): 1 male with same data as holotype. 13 males: "Mex., Temoris, Chih., IX-13-1969": "T.A. Sears, R.C. Gardner, C.S. Glaser." 1 male: "2 mi. N. Choix, Sin., Mex., IX-7-1968"; same collectors. 6 males: "4 mi. NW Choix, Sin., Mex., VIII-29-1968"; same collectors. 8 males: "4 mi. NW Choix, Sin., Mex., IX-1-1968"; same collectors. 4 males: "4 mi. NW Choix, Arroyo del Saucillo, Sin., Mex., IX-1-1968"; same collectors. 89 males: "5.5 mi. NW Choix, Sin., Mex., IX-5-1968"; same collectors. 4 females: "55 k, R.45, Zacatecas, Mex., VII-3-61, R & K Dreisbach." 1 male: "MEX.: Gto., 9 mi. SE San Luis de la Paz, VII-7-64"; "C.D. Johnson, Collector." 2 males, 1 female: "Zimpan, Hdgo., Mex., VII-8-68"; "M. Wasbauer & J. Slansky, Coll.s" 1 male: "Hujintlan, Morelos, Mexico, 8-22-56, R. & K. Dreisbach." 1 male: "Chipancingo, Guer., Mex., 7-24-61, R. & K. Dreisbach." 1 male: "MEX., Mich.: (mi. 43241.0) 1.6 km E Morelia, 2042 m. elev., 13 Sept. 1976, C.. George & R.R. Snelling, colls."; "attracted to Farchan ZZ-ODDA pheromone."

DEPOSITION OF TYPES.—*Holotype:* male (University of California, Davis).

Paratypes (98 males, 5 females): 20 males (University of California, Davis); 10 males (California Insect Survey, University of California, Berkeley); 10 males, 1 female (California Department of Food and Agriculture, Sacramento); 20 males, 1 female (California Academy of Sciences, San Francisco); 20 males (Los Angeles County Museum of Natural History); 20 males (American Museum of Natural History, New York); 8 males, 1 female (Michigan State University, East Lansing); 20 males, 2 females (National Museum of Natural History, Washington, D.C.).

TYPE-LOCALITY.—9 mi (14.5 km) north of Ojo Caliente, Zacatecas, Mexico.

HOST PLANT.—Unknown.

DISTRIBUTION.—Western and central Mexico, from Chichuahua and Zacatecas to Guerrero and Morelos.

DISCUSSION.—Adults were collected in July, August, and September, except for two specimens from Zacatecas taken in May. The moths, particularly the males, apparently congregate in large numbers under certain conditions, which are not as yet understood.

When known localities of *O. bicornicolis* are plotted on a map of the vegetation zones of Mexico, according to Leopold (1950:508), these localities fall either in the "Pine-Oak Forest Zone" or adjoining zones, including "Mesquite-Grassland" in central Mexico on one side of the pine-oak forest and "Tropical Deciduous Forest" in southern and western Mexico on the other edge of the pine-oak forest.

ETYMOLOGY.—The specific name *bicornicolis* is derived from the Latin *bi* (two), *cornis* (horned), and *colis* (penis); it is considered a noun in apposition. The name refers to the two, elongate processes on the aedeagus.

Osminia colimaensis, new species

Figures 7, 11, 16, 24; MAP 1

MEASUREMENTS.—Wing length 7.5 mm. Eye index, 1.75, male.

MALE.—*Head:* Vertex roughened, brown-black and yellow mixed; occipital fringe yellow dorsally, white laterally; front brown-black, much white beneath antenna, laterally, and overlaid medially; labial palpus roughened, white dorsally and mesally, brown-black and white laterally, white ventrally mixed with setaceous brown-black scales; antenna brown-black, powdered yellow ventrally to near apex.

Thorax: Brown-black, overlaid with setaceous straw-colored scales; setaceous white scale tuft behind wing; straw-colored patch beneath wing.

Abdomen: Brown-black; dorsally with posterior margin of each segment paler, two overlaid with setaceous yellow scales, four with some setaceous white scales; anal tuft brown; ventrally all segments overlaid with setaceous white scales, apex beneath anal tuft yellow-orange, yellow scales covering exposed valvae.

Legs: Forecoxa yellow-orange, white laterally; femora brown-black, white setaceous tufting along ventral margin, white on dorsal margin; tibiae brown-black, tufted white medially; tarsi brown-black, much pale yellow to white on first segment and at tarsal joints.

Forewing: Mostly hyaline, margins, veins, discal spot brown-black, lightly powdered yellow, strongest powdering on anal margin; ventrally more strongly powdered yellow on costal margin.

Hindwing: Hyaline, margins very narrow, brown-black; fringe on anal margin becoming white near wing base.

Male Genitalia (Figure 16): Valva apically truncate, costal edge sharply upcurved to apex, thickly clothed with dark setaceous scales on distal one-half, which nearly obscure triangular process in middle of valva; gnathos gradually tapered to sharp, downcurved point; aedeagus with two sharply pointed, rod-like processes apically, one on each side.

FEMALE.—Unknown.

TYPE.—*Holotype* (male): "Colima, Mexico;" "Genitalia Slide by M.R. Papp, CDA 384."

DEPOSITION OF TYPE.—*Holotype:* male (National Museum of Natural History, Smithsonian Institution, Washington, D.C., USNM 77541).

TYPE-LOCALITY.—Colima, Mexico.

HOST PLANT.—Unknown.

DISTRIBUTION.—Known only from the type-locality.

DISCUSSION.—Described from a single male specimen, which has no date or collector on the label. This species is distinctive in the genus because of its mostly hyaline wings with narrow margins and well-defined discal spot.

Osminia donahueorum, new species

FIGURES 5, 9, 15, 19, 25; MAP 1

MEASUREMENTS.—Wing length: 4–7 mm. Eye index 1.41, male and female.

MALE.—*Head:* Vertex relatively smooth, brown-black with yellow or pale orange laterally and in short streak medio-posteriorly; occipital fringe brown-black and pale yellow mixed dorsally, white laterally; front and scale plate brown-black; labial palpus slightly roughened, white with brown-black dorsally and apically; antenna brown-black, but strongly powdered pale orange on dorso-posterior side.

Thorax: Brown-black, variously overlaid with white, pale yellow, pale orange and pink scales; setaceous white scale tuft behind wings; white stripe laterally from collar to wing base.

Abdomen: Brown-black, variously overlaid with white, pale yellow, pale orange and pink scales; segment four with white band on posterior margin dorsally, widening laterally and becoming solid white ventrally.

Legs: Forecoxa white, some brown-black distally; femora brown-black, ventral edge with setaceous white scales; tibiae brown-black except white tuft with dark spine-like scales mixed encircling hind tibia at medial spurs; spurs white; tarsi brown-black with some pale yellow or white on each segment, dark spine-like scales projecting at joints; legs mesally mostly pale yellow or white.

Forewing: Mostly opaque, with small area in cell and one in apical portion just beyond discal spot appearing clear but consisting of white translucent scales, brown-black, variously powdered with white, pale yellow and pink scales; ventrally with much white on basal one-half.

Hindwing: Mostly hyaline; margins brown-black; fringe white toward wing base.

Male Genitalia (Figure 15): Valva relatively narrow, strongly upcurved, with small spine-like projection near center; saccus relatively narrow; gnathos hood-shaped, strongly indented medially; aedeagus with rod-like projection dorsoapically, similar to *O. ruficornis.*

FEMALE.—Similar to the male.

Female Genitalia (Figure 19): Ostium bursae simple, very broad, slightly pigmented, abruptly tapering to narrow, short, somewhat sclerotized, rugose ductus bursae, which gradually widens into obovate corpus bursae; small conical signum on corpus bursae.

TYPES.—*Holotype* (male): "ARIZ: Santa Cruz Co., Madera Cyn., 5600 ft., Bog Springs C.G., 3–5 August 1977, JP & KE Donahue."

Paratypes (85: 53 males, 32 females): 84 with same data as holotype. 1 female: "Ariz., Pima Co., Madera Canyon, VIII-11-1974, Eichlin et al."

DEPOSITION OF TYPES.—*Holotype:* male (Los Angeles County Museum of Natural History).

Paratypes (53 males, 32 females): 10 males, 6 females (Los Angeles County Museum of Natural History); 10 males, 6 females (American Museum of Natural History, New York); 5 males, 3 females (California Insect Survey, University of California, Berkeley); 10 males, 6 females (California Academy of Sciences, San Francisco); 5 males, 3 females (California Department of Food and Agriculture, Sacramento); 13 males, 8 females (National Museum of Natural History, Smithsonian Institution, Washington, D.C.).

TYPE-LOCALITY.—Bog Spring Camp Ground, 5600 ft (1707 m), Madera Canyon, Santa Cruz County, Arizona.

HOST PLANT.—See following discussion.

DISTRIBUTION.—Known only from the type-locality.

DISCUSSION.—This species is named for Kathy and Julian Donahue, Los Angeles County Museum of Natural History, in recognition of their discovery of the species and its possible host plant. All of their specimens (87) were collected at the

flowers of a legume (Fabaceae) identified by Robert Gustafson, Los Angeles County Museum botanist, as *Cracca edwardsii* Gray. Verifications of this plant as a host for *O. donahueorum* would require locating associated larvae or pupae and rearing them to adulthood.

Osminia ferruginea Le Cerf

FIGURE 17, MAP 1

Osminia ferruginea Le Cerf, 1917:328.

MEASUREMENTS.—Wing length 12 mm.

MALE.—*Head:* Vertex roughened, brown-black, white and rust-red mixed; occipital fringe white, some yellow dorsally; front brown-black, some yellow latero-ventrally; labial palpus roughened, brown-black, some yellow mixed; antenna with very short ventral cilia, dorsally brown-black with much orange powdered variously, ventrally orange, scape yellow.

Thorax: Brown-black with setaceous rust-red and yellow scales mixed.

Abdomen: Brown-black; dorsally variously powdered rust-red; ventrally with much pale yellow on segments 4 and 5; anal tuft somewhat elongate-quadrate, rust-red, slightly orange apically.

Legs: Mostly brown-black, but with some pale orange powdered on forecoxa, dorsally on femur, ventrally on foretibia, medially and ventrally on tarsi, tarsal segments brown-black at joints (hindlegs missing on holotype).

Forewing: Mostly hyaline; apical margin somewhat diffuse, brown-black with rust-red; costal margin brown-black with rust-red powdering and between R_3 and R_{4+5}; discal spot brown-black with some rust-red.

Hindwing: Hyaline; margins very narrow, no discal spot, rust-red powdered on anal margin dorsally, but without rust-red powdering ventrally.

Male Genitalia (Figure 17): Much like *O. rufi-cornis* but with saccus more narrow; gnathos of different form, much shorter and not pointed apically; aedeagus more elongate, slender.

FEMALE.—Unknown.

TYPE.—The label on the unique holotype gives the data as "1901-3." We lack a photograph of this species, but it is shown by Le Cerf (1917:328, fig. 3956) and Zukowsky (1936-1937, pl. 178).

DEPOSITION OF HOLOTYPE.—Male (Museum National d'Histoire Naturelle, Paris).

TYPE-LOCALITY.—Near Cordoba, Mexico.

HOST PLANT.—Unknown.

DISTRIBUTION.—Known only from the type-locality.

Osminia phalarocera, new species

FIGURES 4, 8, 14, 22, 26; MAP 1

MEASUREMENTS.—Wing length 5-7 mm. Eye index 1.77-1.84, range for males and females.

MALE.—*Head:* Vertex roughened, brown-black with white, pale yellow and pale orange mixed medially and posteriorly; occipital fringe brown-black with white and pale yellow mixed; front and scale plate brown-black; labial palpus roughened ventrally with mostly even length, white scales, white with brown-black dorsally and apically; antennae brown-black with preapical white spot about one-third distance from apex.

Thorax: Brown-black.

Abdomen: Brown-black; segment 4 with white band dorsally only, band narrower medially; segment 1 with white tuft laterally.

Legs: Forecoxa white, some brown-black distally; femora brown-black; tibiae brown-black except white in tuft dorsally near medial spur pair; tarsi mostly pale yellow to white except for brown-black at joints and first segment of hindtarsi solid brown-black.

Forewing: Opaque, brown-black; dorsally with very few white scales scattered in cell and apically; ventrally strongly powdered white on costal margin to cell.

Hindwing: Mostly hyaline with relatively narrow margins somewhat suffuse; fringe white near wing base.

Male Genitalia (Figure 14): Valva broad, setaceous scales on distal portion and on uncus,

pale, not black as on the other species of *Osminia*, medial projection thin, broad, with margin having wide V-shaped impression forming points on both ends of projection; juxta wide, with slender dorso-lateral projections; gnathos very short, broadly rounded; aedeagus with short, lateral, spine-like projection.

FEMALE.—Similar to male.

Female Genitalia (Figure 22): Ostium bursae simple; ductus bursae elongate, slender, short posterior section sclerotized with small, nearly triangular extension posteriodorsad; corpus bursae relatively large, oblong, signum a large conical projection.

TYPES.—*Holotype* (male): "MEX., Jal. (mi. 72764.9) 3.4 km NW Tequila, 1295 m elev., Sept. 1976, C. D. George & R. R. Snelling, colls."; "attracted to Farchan ZZ-ODDA pheromone."

Paratypes (6): 3 males: "MEXICO: 8 mi. S. Guadalajara, Jal., late Sept. 1954, F.X. Williams"; 1 with "Genitalia Slide By T.D. Eichlin, USNM 76133." 1 male: "Plan de Barranca, 3200, Jal MEX., 25 Sept. 1976, CDG & RRS"; "C. D. George and R. R. Snelling, colls." 1 female "Tepotzlan, Morelos, Mex., 9-26-57, R. & K. Dreisbach"; "Genitalia Slide By T.D. Eichlin, USNM 76134." 1 female: "Cuernavaca, Morelos, Mex., 10-29-57, R.&K. Dreisbach"; "Genitalia Slide By T.D. Eichlin, CDA 383."

DEPOSITION OF TYPES.—*Holotype:* male (Los Angeles County Museum of Natural History).

Paratypes: 1 male, 1 female (National Museum of Natural History, Washington, D.C.); 3 males (California Academy of Sciences, San Francisco); 1 female (Michigan State University, East Lansing).

TYPE-LOCALITY.—3.4 km northwest of Tequila, 1295 m elevation, Jalisco, Mexico.

HOST PLANT.—Unknown.

DISTRIBUTION.—Known only from the type series collected in Jalisco and Morelos, Mexico.

DISCUSSION.—Superficially, *O. phalarocera* resembles *O. donahueorum.* They can be most easily separated by the presence of preapical white spots on the antennae and the absence of white ventrally on the abdomen of *O. phalarocera.* Details of the genitalic structures of the two species are markedly different. All specimens were collected in late September to late October.

ETYMOLOGY.—The specific name *phalarocera* is derived from the Greek *phalaros* (white-spotted) and *kera* (horn); it is considered feminine in gender. The name refers to the preapical white spot on each antenna.

Osminia ruficornis (Edwards)

FIGURES 1–3, 10, 13, 21, 27; MAP 1

Carmenta ruficornis Edwards, 1881:184.
Carmenta minuta Edwards, 1881:185.
Aegeria candescens Edwards, 1882:123.
Tarsopoda marcia Druce, 1889:81.
Osminia ruficornis.—Duckworth and Eichlin, 1977c:28.

MEASUREMENTS.—Wing length 4–7 mm. Eye index 1.57–1.66, range for males and females.

MALE.—*Head:* Vertex roughened, brown-black and yellow mixed; occipital fringe yellow dorsally, white laterally; front gray-black, white laterally; labial palpus slightly roughened, yellow, some brown-black dorsally; antenna blue-black, strongly powdered orange ventrally.

Thorax: Brown-black; collar yellow ventrally; yellow spot before wing base.

Abdomen: Brown-black; segments 2, 4, 6, and 7 banded yellow dorsally; ventrally with four solid yellow or white bands.

Legs: Forecoxa yellow laterally; femora brown-black; tibiae brown-black, broadly ringed with yellow medially; tarsi golden-yellow, ringed with brown-black at joints.

Forewing: Opaque or with small hyaline streak in cell and small hyaline spot distad of discal spot; brown-black, variously but lightly powdered deep orange basally in cell and just beyond discal spot; ventrally powdered yellow basally and along costal margin.

Hindwing: Hyaline; very narrow margins brown-black; narrow discal spot pale yellow or orange; ventrally most veins powdered orange.

Male Genitalia (Figure 13): Valva narrow, upcurved toward apex, with triangular, sharply pointed spine near center; saccus, short, broad;

gnathos elongate, narrow, rod-shaped, sharply downcurved at apex, with thin shelf-like projection ventrad of gnathos; aedeagus with rod-like projection dorso-apically.

FEMALE.—Similar to the male.

Female Genitalia (Figure 21): Ostium bursae somewhat complex, sclerotized, heart-shaped; ductus bursae short, narrow at ostium bursae, where ductus seminalis arises, gradually widening to obovate corpus bursae; corpus bursae with spine-like signum.

DEPOSITION OF TYPES.—*Holotype (O. ruficornis):* male (National Museum of Natural History); Holotype (*C. minuta*): female (Michigan State University). Holotype (*A. candescens*): female (National Museum of Natural History). Lectotype (*T. marcia*): male (British Museum of Natural History).

TYPE-LOCALITIES.—Georgia (*O. ruficornis*). Georgia (*C. minuta*). Arizona (*A. candescens*). Dos Arroyos, Guerrero, Mexico (*T. marcia*).

HOST PLANT.—Unknown.

DISTRIBUTION.—Virginia south to Florida, west to Missouri; southern Arizona to southern Mexico.

DISCUSSION.—Adults of *O. ruficornis* have occasionally been seen congregating at nectar sources during August and September. Though widely distributed and frequently collected, nothing is known of its biology.

Southern Arizona specimens (form "candescens") differ from the typical form by having more orange powdering on the forewing; abdominal banding white, not yellow; white on the collar and mixed with yellow on the spot anterior to the wing base; white dorsally on the labial palpus; white mixed with yellow on the forecoxa; and white replacing the yellow on the hindtibia.

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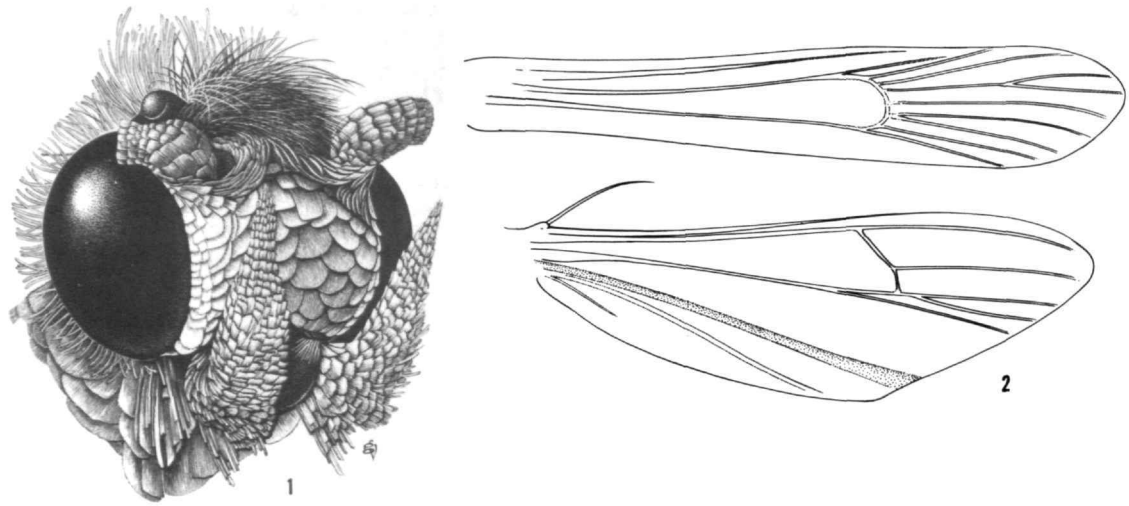
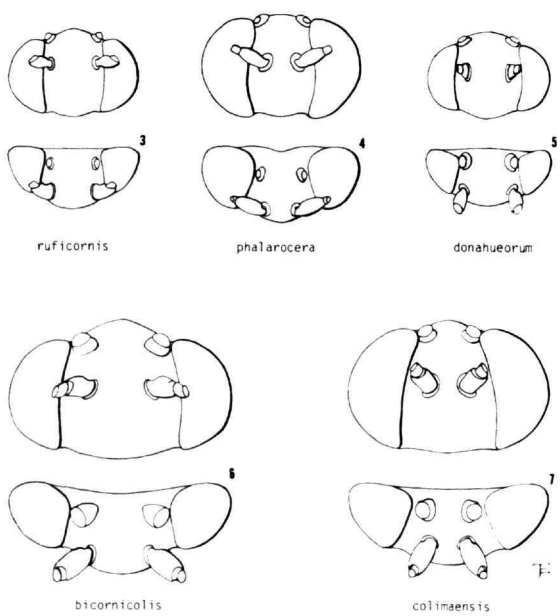
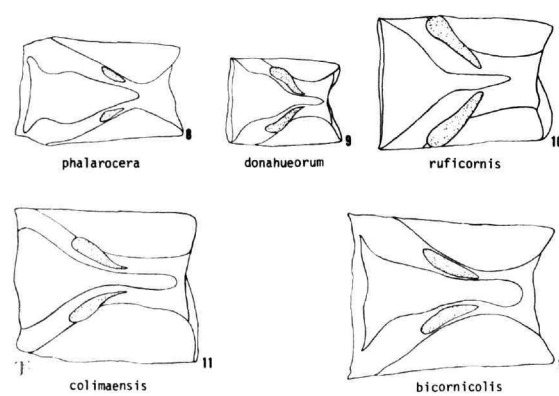


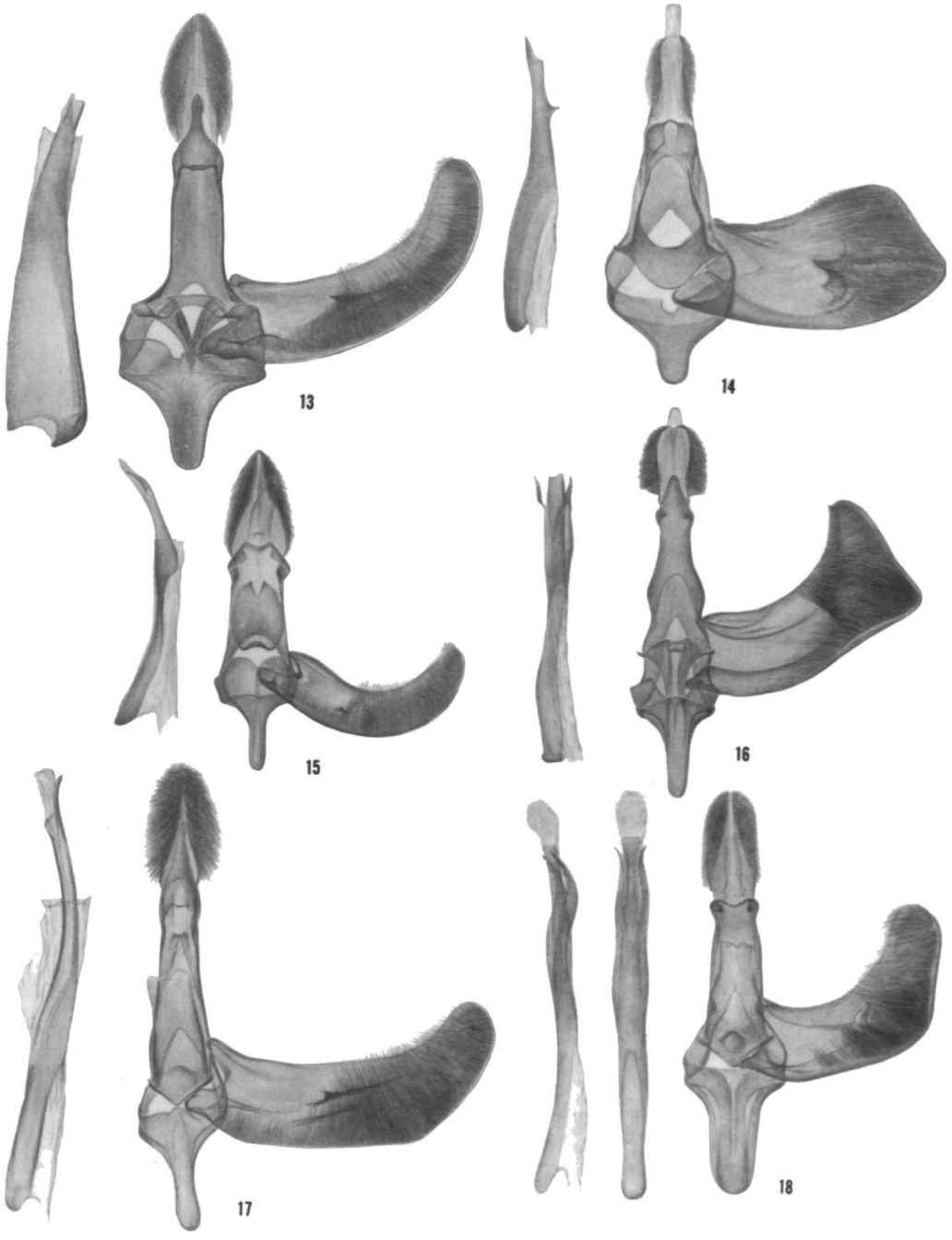
FIGURES 1–2.—Morphology of *Osminia ruficornis*: 1, head (latero-anterior view); 2, wing venation.



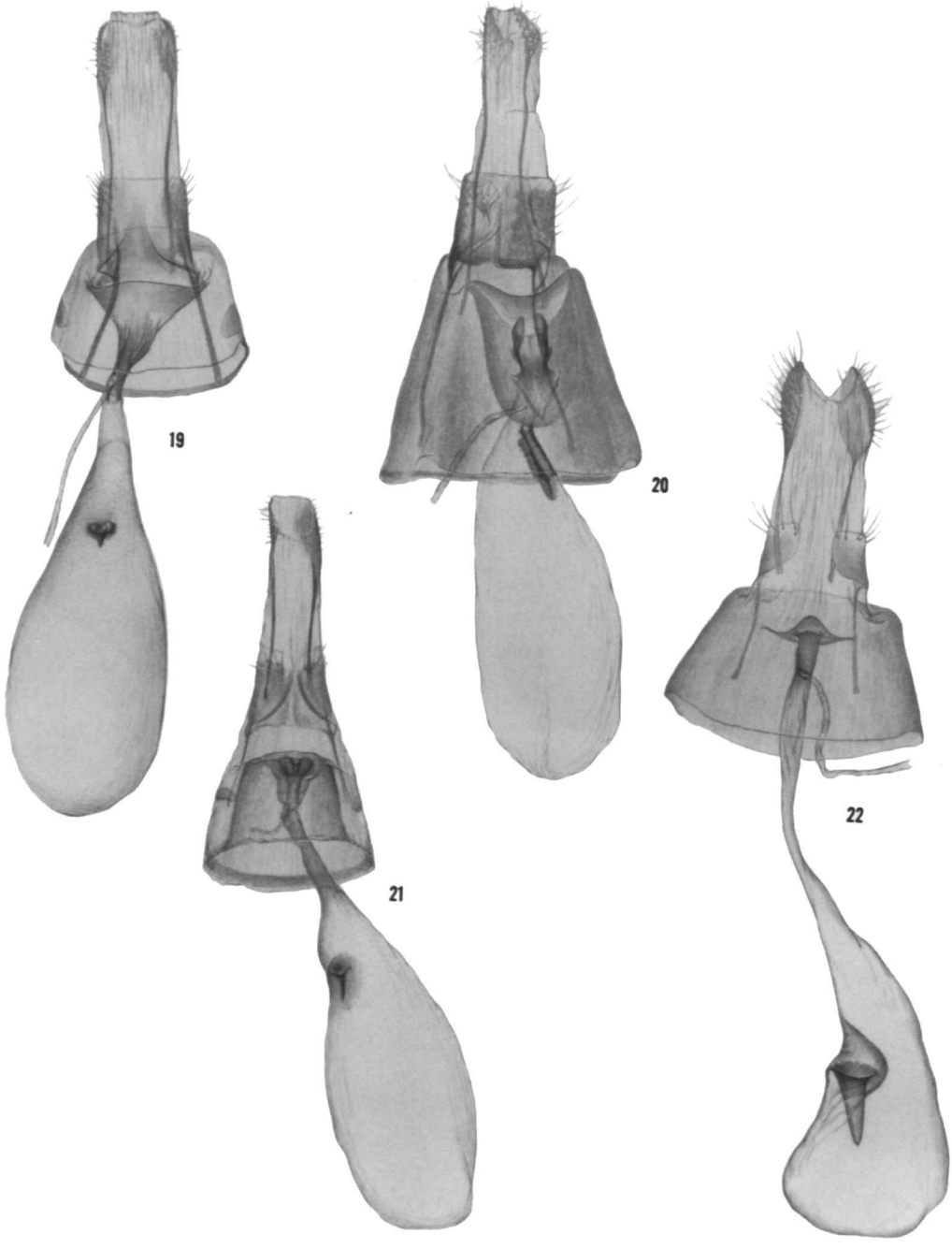
FIGURES 3–7.—Head morphology (schematic), frontal and dorsal views: 3, *Osminia ruficornis*; 4, *O. phalarocera*; 5, *O. donahueorum*; 6, *O. bicornicolis*; 7, *O. colimaensis*.



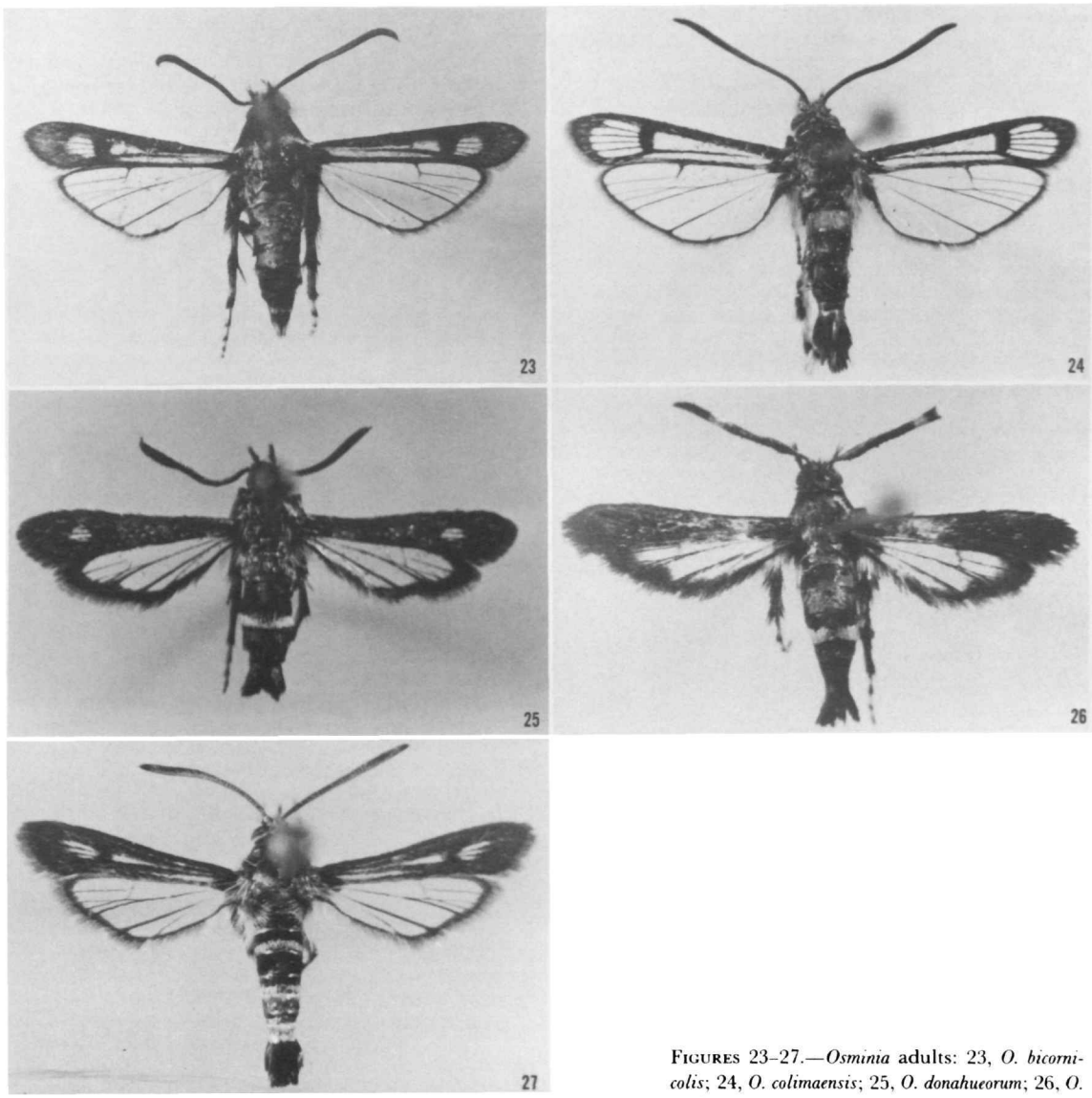
FIGURES 8–12.—Abdominal morphology, dorsal view of abdominal segment eight of male (scales removed): 8, *Osminia phalarocera*; 9, *O. donahueorum*; 10, *O. ruficornis*; 11, *O. colimaensis*; 12, *O. bicornicolis*.



FIGURES 13–18.—Male genitalia (ventral view, right valva removed): 13. *Osminia ruficornis*; 14, *O. phalarocera*; 15, *O. donahueorum*; 16, *O. colimaensis*; 17, *O. ferruginea*; 18, *O. bicornicolis*.



FIGURES 19–22.—Female genitalia (ventral view). 19, *Osminia donahueorum*; 20, *O. bicornicolis*; 21, *O. ruficornis*; 22, *O. phalarocera*.



FIGURES 23–27.—*Osminia* adults: 23, *O. bicornicolis*; 24, *O. colimaensis*; 25, *O. donahueorum*; 26, *O. phalarocera*; 27, *O. ruficornis*.

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