

NORTH AMERICAN TWO-WINGED FLIES OF THE GENUS CYLINDROMYIA MEIGEN (OCYPTERA OF AUTHORS)

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In the preparation of this paper the writer has studied the material contained in the United States National Museum, including his own earlier collecting; the Canadian National Collection; the University of Kansas; the California Academy of Sciences; and the private collections of C. W. Johnson, James S. Hine, A. L. Melander, H. J. Reinhard, and H. W. Allen, together with a few specimens from various other sources. The total number of specimens examined is nearly 800. Special acknowledgment is gratefully made to C. Howard Curran, who when he learned of my work turned over all the material of the Canadian National Collection with a partly prepared paper and numerous drawings. R. E. Snodgrass kindly prepared drawings of the remarkable holding apparatus of the females of *Cylindromyia nana*. Several European species determined by Prof. M. Bezzi are in the United States National Museum, and have been very useful.

The genus *Cylindromyia* was described by Meigen in his famous 1803 paper, the real beginning of dipterous taxonomy. Two years later Latreille described the same genus, with the identical genotype, as *Ocyptera*. Meigen, solely out of deference to his distinguished colleague, as far as can be perceived now, waived his own priority and adopted *Ocyptera* in his next treatment of the genus in 1824. This disposition of the names was accepted for many years. Osten Sacken cited this case in his paper on Priority or Continuity? in 1882, as an illustration of the undesirable effect of too strict enforcement of priority. Professor Bezzi later argued that *Ocyptera* was included in Latreille's 1802 volume, and hence really was prior; that this was an error was not discovered until after he had published his third volume of the Palaearctic Catalogue. Coquillett, in his Type Species paper of 1910, accepted *Cylindromyia*, and was followed by Townsend in 1912.

In the present case we have the consolation, in abandoning a well-known and long-used name, that we are going back to a classic author and a historic work, and choosing a name based on an unquestioned genotype. Even with this much in favor of *Cylindromyia*, I confess I debated the matter a long time in my own mind, and finally yielded with reluctance to what seems the logical conclusion.

Genus CYLINDROMYIA Meigen

- MEIGEN, Illig. Mag., vol. 2, 1803, p. 279. Sole species, *Musca brassicaria* Fabricius.
- LATREILLE, Hist. nat. Crust. et Ins., vol. 14, 1805, p. 378 (*Ocyptera*, with 3 species, of which *Musca brassicaria* was designated as type by Curtis, Brit. Ent., 1837, p. 629).
- FALLÉN, Rhizomyzides, 1820, p. 5 (*Ocyptera*).
- MEIGEN, Syst. Besch., vol. 4, 1824, p. 209 (*Ocyptera*).
- ROBINEAU-DESVOIDY, Myodaires, 1830, pp. 229, 231 (*Ocyptera* and *Parthenia*, the latter with 3 species, of which Coquillett designated *boscii* as type in his Type-Species, 1910, p. 585).
- MACQUART, Hist. Nat. Dipt., vol. 2, 1835, p. 180; Dipt. Nord Fr., 1834, p. 215; Dipt. Exot., vol. 2, pt. 3, 1843, p. 232 (all *Ocyptera*).
- ZETTERSTEDT, Dipt. Scandinav., vol. 3, 1845, p. 1219 (*Ocyptera*).
- RONDANI, Dipt. Italicae. Prod., vol. 1, 1856, p. 78; vol. 4, 1861, p. 122 (both *Ocyptera*).
- SCHINER, Fauna Austriaca, vol. 1, 1862, p. 412 (*Ocyptera*).
- OSTEN SACKEN, Wien. Ent. Ztg., vol. 1, 1882, p. 191, says *Cylindromyia* is prior, but prefers to retain *Ocyptera*.
- BRAUER and BERGENSTAMM, Zweifl. Kais. Mus., vol. 4, 1889, p. 138; vol. 5, 1891, pp. 387, 407; vol. 6, 1893, p. 143 (all *Ocyptera*).
- PANDELLÉ, Revue Entom., vol. 13, 1894, pp. 32, 57 (*Ocyptera*).
- COQUILLETT, Revis. Tachin., 1897, p. 86, key to North American species (*Ocyptera*); Type-Species, 1910, 529, adopts *Cylindromyia* (Proc. U. S. Nat. Mus., vol. 37).
- VILLENEUVE, Wien. Ent. Ztg., vol. 22, 1903, p. 37 (*Ocyptera*, European species, with notes on Meigen's types).
- VAN DER WULP, Biologia, Dipt., vol. 2, 1903, p. 449, key to North American species (*Ocyptera*).
- BEZZI, Wien. Ent. Ztg., vol. 26, 1907, p. 55; Kat. Pal. Dipt., vol. 3, 1908, p. 429 (both *Ocyptera*).
- TOWNSEND, Muscoid Flies, 1908 (Smiths. Misc. Colls., vol. 51, No. 1803), p. 81, notes on species (*Ocyptera*); Proc. Ent. Soc. Wash., vol. 14, 1912, p. 48, adopts *Cylindromyia*, notes on habits; Insecutor Ins. Menst., vol. 3, 1915, p. 94 (*Apinocyptera*, type *signata*, new); Journ. New York Ent. Soc., vol. 23, 1915, p. 233 (*Odontocyptera*, type *nana*, new); Insecutor Ins. Menst., vol. 4, 1916, p. 32 (*Neocyptera*, type *dosiades* Walker); Proc. U. S. Nat. Mus., vol. 49, 1916, p. 631 (*Ocypterodes*, type *euchenor* Walker).
- APSTEIN, Sitzungsber. Naturforsch. Freunde Berlin, 1915, No. 5, p. 166, lists *Ocyptera*, type *brassicaria* Fabricius, in his proposed nomina conservanda.
- STEIN, Archiv. f. Naturgesch., vol. 96, 1924, p. 173, key to European species, with brief descriptions (*Ocyptera*).

The species of *Cylindromyia* are remarkably uniform in most of their characters; even those which show specializations in the female

ovipositing apparatus are in the male sex, as far as known, quite within the range of the rest of the genus. Several species show in the females some specialization tending toward a single holding hook instead of a symmetrical pair, and this is more or less associated with the development of special groups of spines on the venter. Attention is especially called to the remarkable condition in *nana* Townsend, in which one of the hooks is weak at base and regularly breaks off at an early stage in the activity of the adult female fly.

As a detailed description of all the species would consist mostly of unprofitable repetition, it is thought best to begin with the generic characters (liberally interpreted) of the type species *brassicaria* of Europe, taken from specimens identified by Professor Bezzi. After the key, each North American species is described only as far as the characters seem important for separating the species from *brassicaria* or known North American species. By this method it is hoped to save a good deal of space and yet omit nothing of significance.

Generic characters of Cylindromyia (from the type species)—head in profile almost as long as high, from front a little wider than high (length 39, height 42, width 51 units of micrometer); the lower edge long and straight, the back bulging, so that the bare eyes are in profile about as far from the back edge as from the front; front moderately wide, .30 of head width in both sexes; frontal stripe broad, of uniform width to antennae, which are inserted above middle of head, moderately long, the arista bare, with distinct but not elongated penultimate joint. Face not receding, slightly keeled above, the epistoma jutting out between the vibrissae, facial ridges bare. Parafacials bare. Palpi generally absent, occasionally present in a very rudimentary condition (in European material—I have seen but one case in the American; strangely enough this variability seems not to be even of specific value); proboscis slender but not much elongated. Verticals one large pair; ocellars one smallish pair directed forward and outward, behind the ocellar triangle another pair directed outward, and still another small pair behind these on the occiput directed upward; two pairs orbitals in female, none in male; frontals about eight, none of the upper distinctly larger and reclinate, the lowest just at insertion of antennae, the row not diverging toward the eye; bucca with only a single row of bristles along lower edge, disappearing behind.

Thorax rather narrow, barely as wide as the head, with prominent humeri, the suture behind the middle. Postscutellum distinct. Chaetotaxy: acrostichal 0, 0; dorsocentral 3, 3; humeral 2, and numerous outstanding stout hairs; posthumeral 1; presutural 1; notopleural 2; supraalar 1, stout; intraalar 2, only a little above the preceding; postalar 2; scutellum with two stout lateral pairs and a small decussate apical, no discal; sternopleural 2; pteropleural 0;

hypopleural 3 to 4; mesopleural 5 or 6 behind, one at lower front angle; prothoracic 2 (just above front coxae); prosternum bare; postalar declivity bare; postnotum at side below calypter destitute of minute hairs.

Abdomen narrow and elongate, the basal segment which in most Tachinidae is not visible from above is quite distinct though short (following custom I have ignored this in counting the segments); this short segment is without bristles; the first principal segment has a pair of median bristles not near the margin, and on each lateral margin three, one behind the other; second segment with one median marginal pair and one lateral near hind margin; third segment with marginal row of four, no laterals; fourth segment with a row of about 8, which are discal in the middle, marginal at the sides (the American are mostly marginal in the middle); fifth or first genital segment in male with one pair of small bristles projecting backward. Basal sternite of abdomen overlapping the tergites, the following sternites however concealed; second tergite with a few bristles at hind angles below near median line.

Male (fig. 1) with the usual posterior (or inner) and anterior (or outer) forceps, the former pale and much less chitinized than the latter. Female with last genital segment forming a theca or cup, open apically, where a small sting protrudes; on each side at tip the chitin is produced into a curved horn or hook, not jointed, no doubt used in holding the host during the insertion of the sting. The structure is almost identical with that of *intermedia* (fig. 25).

Legs stout, claws and pulvilli elongated in male, not in female.

Wings narrow; fourth vein with stump at bend, the last section sinuous, joining the third considerably before its apex, petiole of third vein curving forward to join the costa far before apex. Veins bare except a few hairs at base of third. Hind crossvein sinuous, joining fourth vein about last fifth of its penultimate section.

Our species, like those of Europe, separate into three groups on the bristles of the scutellum; Pandellé used these characters in 1894, and Coquillett in 1897. Our *dosiades* has a single pair of scutellars (the posterior laterals of Pandellé), while *intermedia* and *nigra* have in addition a small crossed apical pair. *Compressa*, known from a single female, has in the type only one of the apicals, hence may belong to either of the two groups. All the rest of our species have in addition to the two pairs mentioned a lateral pair near base (anterior lateral of Pandellé).

Females of our species separate into three groups on the presence or absence of groups of short ventral setules on the abdomen, on a swelling of the segment. *C. dosiades* and *compressa* have such a swelling with spinules on the first principal segment; *nana* and

signata have it on the second; while the other species do not have it at all.

We have but one species, *intermedia*, with the hind tibiae villous on the flexor side in the male; and only one species, *dosiades*, with discal bristles (both sexes).

The principal male genital organs for taxonomy are the forceps. The posterior (or inner) originate at the sides of the anus, and are usually of soft consistency. The anterior (or outer) are well chitimized, blade-like. The penis is quite simple and seems to present no tangible characters. The fifth sternite is here a delicate plate, hardly more than a membrane, and usually invisible until the genitalia have been pulled out of their cavity; it then shows important characters in the width of the median incision, etc.

The female genitalia are adapted for holding the host insect during the insertion of the sting, which is much like that of a wasp. The last segment turns up against the preceding portion of the abdomen, and in most species has two lateral terminal unjointed hooks; the presence of these and their shape are of importance in separating the species.

In the wing the sinuosity of the hind cross vein is of some importance, but most of the supposed characters are variable and I have made little use of them.

Systematic position.—Fallén was the first to attempt subdivisions corresponding to what we would now call families in the muscoid group. He separated *Ocyptera*, *Gymnosoma*, and *Alophora* (which he called *Thereva*) from his Muscides in a family Rhizomyzides (Faun. Suec., 1820). Robineau-Desvoidy (Myodaires, 1830, p. 222) proposed a group Ocypteratae, which apparently would rank between a subfamily and a tribe in the terms now used. Macquart (Dipt. Nord France, 1834, pp. 142, 212) adopted the same name; but as he greatly reduced the number of groups he in effect made this of family rank. Schiner adopted Macquart's major groups with but a slight change, having a subfamily Ocypterinae of equal rank with his Tachininae and Dexiinae. Brauer and Bergenstamm at first¹ recognized a family Ocypteridae; but later they receded from most of their family names and² then designated a "Gruppe Ocyptera," which they placed between "Gruppe Pseudominthoidae" and "Gruppe Micropalpus." In their third paper³ they have a slightly extended "Sectio Ocyptera." Girschner⁴ seems to have made no place for the genus, as it does not run to any of his divisions. Pandellé⁵ has a subfamily Ocypterinae in his family Tachinidae.

¹ Zweifl. Kais. Mus., vol. 4, 1889, p. 138.

² Vol. 5, 1891, p. 407.

³ Vol. 6, 1893, p. 143.

⁴ Illust. Wochenschrift f. Ent., vol. 1, 1896, p. 111 and preceding.

⁵ Rev. Ent., vol. 13, 1894, p. 28.

Bezzi ⁶ places *Ocyptera* in Dexiinae. Baer ⁷ does the same. Stein's posthumous work ⁸ treats all muscoids with hypopleural bristles as the single family Tachinidae, without introducing subfamilies.

In the United States, Coquillett ⁹ included *Ocyptera* in his Tachinidae. Townsend ¹⁰ in 1912 placed *Cylindromyia* in a tribe *Cylindromyini* of the subfamily Phaniinae, family Exoristidae; he added the unique suggestion that the tribe *Compsilurini* would go in the same subfamily. In a manuscript outline of his classification, submitted quite recently, he puts the tribe *Cylindromyini* in the family Phasiidae.

In the present paper it is proposed to consider *Cylindromyia* the chief member of the small subfamily Cylindromyinae of the family Tachinidae. No attempt will here be made to analyze the other components of the group.

Biology.—About a century ago, Dufour observed the parasitism of the European *Cylindromyia bicolor* Olivier on the Pentatomid *Rhaphigaster grisea* Fabricius; ¹¹ he figured adult and larva. Nielsen has given a report of some studies of his own, of *Cylindromyia brassicaria* Fabricius parasitic on another Pentatomid, *Dolycoris baccarum*. ¹² He found larvæ in the first and third stages at the same time in the last of July, but only one in each host. He noted that the larva hibernates in its host in the second stage, and that it does not kill the host, even at the time of exit. It pupates in the ground. He thinks the fly is ovoviviparous (Pantel's group 9).

Caffrey and Barber, in Bulletin 779 of the United States Department of Agriculture, have noted on page 31 that they reared eight specimens of *Cylindromyia armata* (as *Ocypterodes euchenor* Walker) from adults of the Pentatomid *Chlorochroa sayi* Stal at Maxwell, New Mexico. I correct the species from one of the specimens. Townsend reported the rearing of *euchenor* by Forbes in Illinois from Acrididae and from *Leucania unipuncta*; ¹³ but these records may well be doubted, as all the others are from Pentatomidae.

KEY TO NORTH AMERICAN SPECIES OF CYLINDROMYIA

1. Scutellum with only one pair of bristles (fig. 17) ; abdomen with discal macrochaetae (widespread; *dosiades* Walker) ----- *dosiades* Walker.
- Scutellum with two pairs of bristles—a small decussate apical pair and another much larger not far from them (fig. 16) ----- 2
- Scutellum with three pairs of bristles, the additional pair being near the base at the sides (fig. 15) ----- 4

⁶ Kat. Pal. Dipt., vol. 3, 1908, p. 429.

⁷ Die Tachinen, 1921, p. 157.

⁸ Arch. f. Naturgesch., p. 96, 1924.

⁹ Revis. Tachin., 1897, p. 86.

¹⁰ Proc. Ent. Soc. Wash., vol. 14, p. 48.

¹¹ Annales Sci. Nat., vol. 10, 1827, pp. 246–260, pl. 11.

¹² Entom. Medd., ser. 2, vol. 4, 1909, pp. 76–81, figs.

¹³ Psyche, 1893, p. 466.

2. Abdomen without red on sides, wholly black; front basitarsus shorter than the four following joints (eastern; *argentea* of Coquillett 1897, not of Townsend)----- *nigra*, new species.
Abdomen broadly red on sides----- 3
3. Female with distinct, symmetrical hooks on last genital segment, which are placed quite far apart; male with the front basitarsus as long as the following four joints and concave on outer side, also with hind tibia villous on inner side (widespread west and north; European)-- *intermedia* Meigen.
Female with last genital segment compressed, pointed, without hooks; fourth abdominal segment with a pair of stout bristles near base above; male presumably without the characters just mentioned (Alberta).
compressa, new species.
4. Abdomen wholly shining, the incisures not white pollinose (Colorado).
alticola, new species.
Abdomen with very evident white pruinosity----- 5
5. Tibiae red; veins around discal and first posterior cells with sharply blackish borders (California, Mexico)----- *limbata*, new species.
Tibiae black; the dark color of the wings more diffused----- 6
6. A conspicuous white pollinose spot on the sclerite just above the posterior thoracic spiracle (Cuba)----- *bakeri*, new species.
No such spot, the sclerite shining black----- 7
7. Abdomen without any red; large species (Porto Rico)----- *atra* Roeder.
Abdomen broadly red on sides or apically----- 8
8. Males ----- 9
Females ----- 14
9. (MALES)—The posterior forceps short and greatly swollen, soft and cushion-like, but suddenly contracted into a small apical beak----- 10
The posterior forceps long and soft, basal half swollen, suddenly reduced at middle, the apical portion reaching almost to tips of anterior forceps (eastern, widespread)----- *argentea* Townsend.
Posterior forceps not as described----- 11
10. The fifth sternite with a wide, shallow emargination in the middle (eastern)----- *euchenor* Walker.
The fifth sternite with two narrow prolongations close together, forming a deep narrow notch at the middle line (Mexico City; Dominica).
uniformis, new species.
11. Both pairs of forceps yellow, shining, alike in consistency, the posterior chitinized, both pairs small and somewhat concealed by the thin yellow expanded margin of the last genital segment (widespread).
nana Townsend.
The posterior pair of forceps much less chitinized than the anterior pair, which are hard and shining----- 12
12. Anterior forceps very broad apically, broader than at base, subtruncate (widespread)----- *armata*, new species.
Anterior forceps tapering toward tip, not so wide apically----- 13
13. Posterior forceps short and in profile rather thick, but not strikingly swollen, about half as long as anterior ones, which are grooved behind at the bend; back of head with some black hair on each side of the occipital region above (widespread)----- *decora*, new species.
Posterior forceps more than two-thirds as long as anterior, which are not grooved behind at the bend; back of head with only pale hair inside the orbital row (widespread; *euchenor* of Townsend 1916).
vulgaris, new species.

14. (FEMALES)—Second principal segment underneath with a large crescent-shaped area of short stubby spines on a prominence, behind which is a concavity; terminal hooks of last genital segment unsymmetrical or only one present----- 15
 Second abdominal segment destitute of such spiny, swollen area; hooks of last genital segment symmetrical----- 16
15. Large tropical species with only one genital hook, which is strikingly large; fifth and sixth abdominal segments red (Guatemala) -- *signata* Townsend.
 Small, more northern species, the left genital hook deeply grooved at base if present, usually broken off; tip of abdomen shining black (widespread).
nana Townsend.
16. The hooks on last genital segment attached below a square upper apical shoulder of the segment----- 17
 Last genital segment without such shoulder, sloping down to the hook-- 19
17. With only 2 sternopleurals; genital hooks as in *armata* (widespread).
decora, new species
 With 3 sternopleurals----- 18
18. The genital hooks pointing decidedly forward, gradually turned upward (widespread)----- *armata*, new species.
 The genital hooks turned upward from base, standing close to shoulder, the tips divaricate (widespread)----- *euchenor* Walker.
19. Usually with only 4, sometimes with 6, bristles on tergite of fourth abdominal segment; large, common species (eastern)----- *argentea* Townsend.
 With more than 6 bristles on the tergite of fourth abdominal segment (widespread)----- *vulgaris*, new species.

CYLINDROMYIA DOSIADES Walker

(Figs. 7, 22)

Ocyptera dosiades WALKER, List. Dipt. Ins., vol. 4, 1849, p. 695.—VAN DER WULP, Tijdschr. Ent., vol. 26, 1883, p. 15, occurs in Quebec.—GIGLIO-TOS, Ditt. del Messico, vol. 3, 1893, p. 3.—COQUILLETT, Revis. Tachin., 1897, p. 86.—JOHNSON, List Ins. New Jersey, 1899 and 1910; List Dipt. of Florida, 1895 and 1913.—HINE, Canad. Ent., vol. 36, 1904, p. 91.—VAN DER WULP, Biologia, Dipt., vol. 2, 1903.—CHAGNON, Entom. Student, vol. 2, 1901, p. 15, occurs in Montreal.—GIBSON, Entomol. Record, 1911, 1914, 1915, occurs in Canada.—VAN DUZEE, Canad. Ent., vol. 43, 1911, p. 237, occurs in Kearny, Ontario.—WINN and BEAULIEU, Ins. Prov. Quebec, 1915, p. 141.—BRITTON, Check-List Ins. Connecticut, 1920.—COLE and LOVETT, List Dipt. Oregon, 1921, p. 301.—BRIMLEY, Ent. News, vol. 33, 1922, p. 232, occurs in North Carolina.

Ocyptera euchenor TOWNSEND, Journ. New York Ent. Soc., vol. 5, 1897, p. 176 (makes *dosiades* a synonym); Psyche, 1897, p. 149.

Ocyptera euchenor, var. *dosiades* TOWNSEND, Psyche, 1898, p. 212.

Neocyptera dosiades TOWNSEND, Insecutor Ins. Menst., vol. 4, 1916, p. 32.

The species has the usual red or yellow areas on the sides of the abdomen, leaving a rather wide median black stripe, and the whole posterior end of the abdomen shining black.

The male has the posterior forceps entirely united, brown and enlarged at base, where they bear a tuft of black hair; apically they run out in a long yellowish point, slender in profile, grooved behind,

nearly as long as the anterior forceps; the latter are shining black, moderately slender, gently curved to a rounded apex. The sides of the last genital segment project in a thin yellow process along the side of the cavity containing the genital organs.

In the female the last abdominal segment is in the form of a deep spoon with a deep median notch in its apex, from which the sting usually projects; there are no hooklike processes on the segment.

The type of *dosiades* from Nova Scotia is in the British Museum. The species is quite recognizable from the description, and I am assured by Maj. E. E. Austen that we have it correctly identified (as *dosiades*, he is not responsible for the synonymy). Sixty-eight specimens before me of both sexes show the following distribution:

In National Museum.—Vicinity of Washington, District of Columbia, including adjacent Maryland and Virginia, 14 specimens collected by McAtee, Walton, Knab, Rohwer, Barber, Greene, Myers, Jackson, and Aldrich; others from Bar Harbor, Maine (C. W. Johnson); White Mountains, New Hampshire (Morrison); base of Mount Washington, New Hampshire (Townsend); Wilmington Notch, Adirondacks, New York (Aldrich); Oswego, New York; Harrisburg, Pennsylvania (Walton); La Fayette, Indiana (Aldrich); South Georgia (Morrison); Minot, North Dakota, and Moscow, Idaho (Aldrich); Lindsay, California (McGregor); Rampart, Alaska, "through B. Preston Clark." The last locality is almost at the Arctic Circle, on the Yukon.

In the Canadian National Collection.—Oliver, British Columbia (Garrett); Agassiz, British Columbia (Glendenning); Banff, Alberta (Garrett); Aylmer, Quebec (Miss G. Beaulieu); Ottawa, Ontario.

In Professor Melander's collection (all collected by him except as noted): Woods Hole, Massachusetts; Lyndon, Vermont; Chicago, Illinois; Moscow and Chatcolet, Idaho; Perma, Montana; Pullman, Seattle, and Lake Cushman, Washington; Stanford University, California (Mann); Pullman, Washington (Mann).

In Professor Hine's collection.—Peelee Island, Ontario (Gaige); Kaslo, British Columbia (Osburn); Winona Lake, Indiana.

In H. J. Reinhard's collection.—Ohio (Reinhard).

Two specimens in Professor Melander's collection (Waubamic, Ontario and Alмота, Washington) have no discals on the second and third segments; one specimen from Laggan, Alberta (Osburn, in Hine's collection), and one from Colorado, have the regular pair of small decussate apical scutellars occurring on other species of this genus; and one specimen from Bottineau, North Dakota (Ainslie), has the head unusually long on its lower edge. With the available material I do not consider these aberrations specific.

CYLINDROMYIA COMPRESSA, new species

(Fig. 23)

A small species of ordinary appearance, known only in the female, and having very unusual egg-laying apparatus. Parafacials and parafrontals silvery, the former a little wider than the third antennal joint. Antennae black, rather small, the second joint considerably more than half the third. Sternopleural two. Scutellum with one large pair of bristles near the apex, between which in the single specimen there is an apical bristle on one side but not on the other. First and second abdominal segments red except the base of first and a very little of the apex of the second above. The first has only two lateral bristles, one near the base, the other near the hind edge. No discals except a pair near the base on fourth segment. On the median line below the ends of the first principal tergite seem to fuse together behind, and in this region bear about 20 distinct small spiny bristles on a slight swelling. In profile the venter of the second segment is a little concave. The third and following segments of abdomen are shining black. The third segment below with a median groove for the reception of the tip of the last genital segment; this groove continues on the fourth segment where it is mostly filled up by a globose shining black median sclerite; fifth segment contracted and tapering; sixth segment rather long, compressed, curved, shining black, drawn out into a sharp upturned point as viewed in profile; the point is composed of two blade-like portions divided below for some distance and between them the sharp sting projects. Front tarsi with a slight widening of the last three joints. Wings with rather uniform smoky coloration, more yellow in the costal cell and at base.

Length, 7.6 mm.

Described from a single female specimen taken at Banff, Alberta, by C. B. D. Garrett.

Type in the Canadian National Collection.

This species is most nearly related to *dosiades*, in which occasionally the discals are partly absent. Whether *compressa* normally has one pair of scutellars or two can not be decided from the single specimen, in which the apical pair is represented only by a bristle on one side. Both of these species have in the female a swollen, spiny area on the venter of the first abdominal segment, not the second as in *signata* and *nana*; they also have no hooks on the last genital segment. There is no doubt of the distinctness of *compressa* however, as the last genital segment is much more acute and compressed than in *dosiades*.

The European *interrupta* Meigen is very much like this species, as I note from a female in the Canadian collection kindly sent me for study. It has discal abdominal bristles however.

CYLINDROMYIA NIGRA, new species

(Figs. 10, 32)

Ocyptera argentea TOWNSEND, Coquillett, Revision Tachin., 1897, p. 86 (misidentification).—JOHNSON, Cat. Ins., New Jersey, 1899 and 1909.—BANKS, Ent. News, vol. 23, 1912, p. 110.—BRIMLEY, Ent. News, vol. 33, 1922, p. 24 (*argentata*, a slip of the pen).

A small species easily distinguished by the characters in the key. The vertex is shining, and the parafacials and parafrontals have smooth pale yellow pollen; the parafacials are rather narrow, and the frontal stripe is narrower than one parafrontal in its middle. Antennae black, but the tip of second joint and base of third reddish; third joint one and one-half times the second. In profile the eye is nearer the front than back of the head. Bucca about one-eighth of the eye.

Thorax black, the silvery pollen of the sides extending upon the dorsum to include the presutural bristle.

Abdomen wholly black, the white pruinose bands arcuate, so as to include a little of the back edge of the first and second segments at the middle, and also extending upon the venter. First principal segment with only two bristles on the lateral margin; fourth segment without bristles except one on each side.

Wings brown, fourth vein generally not with stump at bend, the apical cell wide distally; hind crossvein straight, almost erect.

Male.—Second principal abdominal segment with a cluster of four spines at the median line below, on the inflexed tergite before its posterior edge. Posterior forceps united to tip, of soft texture, basally brownish, apically whitish and swollen, as long as anterior ones, which are shining brown and end in a sharp point on the anterior edge.

Female.—Abdomen uniformly keeled below to middle of third segment, the second without distinct ventral depressed bristles. Last genital segment with very distinct terminal hooks rather close together, their tips turned a little toward the segment.

Length, 5.5 to 6 mm.

Described from 32 specimens of both sexes. In the United States National Museum are 16 specimens collected in the District of Columbia and adjacent Maryland and Virginia, by Knab, Barber, McAtee, and Shannon. Two specimens from Chesapeake Beach, Maryland (Aldrich), include the allotype female. Others are from Baltimore, Maryland (Barber); Mechanicsburg, Pennsylvania (Walton); Delaware County, Pennsylvania (Johnson); Westville, New Jersey (Johnson); Wenonah and Trenton, New Jersey (Harbeck); New Haven, Connecticut (H. B. Kirk).

In C. W. Johnson's collection are specimens from Waltham, Massachusetts, and Orange Mountain, New Jersey, both collected by Johnson.

In Professor Hine's collection are specimens from District of Columbia, and one from Newark, Ohio, all collected by Hine.

In Mr. Reinhard's collection are specimens taken by him at College Station, Texas.

In the American Museum of Natural History is a male from Cuba, "7 K. north of Vinales."

Type.—Male, Cat. No. 28279, U.S.N.M., from Glencarlyn, Virginia.

Allotype from Chesapeake Beach, Maryland.

CYLINDROMYIA INTERMEDIA Meigen

(Figs. 2, 25)

Ocyptera intermedia MEIGEN, Syst. Besch., vol. 4, 1824, p. 212.—SCHINER, Fauna Austr., vol. 1, 1862, p. 416.—VILLINEUVE, Wien. Ent. Ztg., vol. 22, 1903, p. 40.—STEIN, Arch. Naturgesch., vol. 90, 1924, p. 176.

Ocyptera excisa LOEW, Dipt. Beitr., vol. 1, 1845, p. 19.—PANDELLE, Rev. Ent., vol. 13, 1894, p. 62.

Ocyptera californica BIGOT, Ann. Soc. Ent. France, 1878, p. 42.—BRAUER, Sitzungsber, Kais. Akad. Wiss. Wien, vol. 107, 1898, p. 1, note on type.

This well marked European species is very common in the western part of the United States, from about the Great Plains, and in Canada extends much farther east. I identified the species by Stein's recent paper and also by careful comparison with a pair from Europe identified by Professor Bezzi. The genitalia of both sexes were compared.

The species is the only one having the hind tibia villous on the flexor side in the male and also having in the same sex a very characteristic structure of the front basitarsus, which is concave on the outer side before the middle and considerably longer than usual. The species is like *nigra* in having only one large lateral pair of bristles on the scutellum and a small apical pair. It has the abdomen more broadly red than any other species, at least on the average, the second principal segment being usually without any black color. It was this peculiarity which led me to suspect that *californica* Bigot is the same species. J. E. Collin kindly examined Bigot's type with reference to some of the points and his statements seem to prove that my surmise was correct.

The venter is silvery pollinose next the eye, and the parafrontal and parafacial are also; the latter is rather wide, almost twice as wide as the slender third antennal joint. The antennae are more or less red from the base to the vicinity of the arista. The sides of the thorax are silvery pollinose up the posthumeral bristle and there is a very distinct narrow silvery median stripe reaching about to the suture. The second principal segment of the abdomen in the male has on the under side next to the median line two or three small appressed bristles on each side on the hind corner of the tergite.

The fifth sternite (so retracted that it is usually invisible without spreading) has a narrow notch in the middle. The posterior forceps in the male are united, brown in color, rather short and of equal width in profile, with a minute apical tooth on the anterior side. The anterior forceps are shining brown, considerably longer, straight, and at the tip broadly curved forward to a rather sharp point. The lateral margin of the last genital segment forms a slender almost fingerlike small yellow process on each side. In the female the last genital segment is reddish toward the apex with a broad terminal opening, on each side of which a strong hook curves forward and upward, but not situated so as to form a deep notch with the body of the segment. The ventral side of the abdomen is smooth and regular without cluster of spines. The front tarsi of the female are noticeably elongated and flattened, the same also in the European specimen.

Length, 8 to 10.5 mm.

Described from 97 specimens, of both sexes, besides a male and female from Europe (Bezzi).

In the National Museum: Edwall, Fishtrap Lake, and Pullman, Washington; Moscow and Lewiston, Idaho; Lafayette, Indiana (all the preceding collected by Aldrich); Peaceful Valley, Colorado (Cockerell); Louisville, Colorado (M. H. Perkins); Bonaparte Lake, Okanogan County, Washington, and Bead Lake, Newport, Washington (Lane); Priest Lake, Idaho (Piper); Reno, Nevada (Wickham); Elkhorn Mountains, Montana (Mann); Shields River, Montana (Hunter); Eagle Creek, Oregon (Melander); Kaslo, British Columbia (Osburn); Beach, North Dakota (Ainslie); Denver, Colorado (Dyar and Caudell); Owl Creek Mountains, Wyoming (Currie); Walnut Creek, California (Davidson); Claremont, California (Baker); Pasadena, California (Grinnell); Koehler, New Mexico (Walton); Texas (Belfrage).

In the Canadian National Collection: Sudbury, Ontario, July 7, 1889; Lethbridge, Alberta (Seamans, Strickland); Aweme, Manitoba (Vroom, Robertson); Fort Wrigley, McKenzie River (C. H. Crickmay); Waterton Lakes, Alberta (McDunnough); Osoyoos, British Columbia (Garrett); Lillooet, British Columbia.

In Kansas University: Washington Territory; California (Baron); Estes Park, Colorado (Snow); Clark County, Kansas (Snow); Reno, Nevada (Hillman); Douglas County, Kansas (Snow); Ellis County, Kansas (Williams); Johnson County, Kansas (Beamer).

In Professor Melander's collection: Pullman, Washington; Mount Moscow and Priest Lake, Idaho; Eagle Creek, Oregon (all preceding collected by Melander); Almota, Washington (Yothers); Torrey's Lake, Wyoming, September 7, 1895 (Wheeler).

In Professor Hine's collection: Kaslo, British Columbia (Osborn); Amidon, Slope County, North Dakota, and Stump Lake, Nelson County, North Dakota (Hubbell).

CYLINDROMYIA ARGENTEA Townsend

(Figs. 3, 27)

Ocyptera argentea TOWNSEND, Proc. Ent. Soc. Wash., vol. 2, 1891, 144.

As this species was misidentified by Coquillett in his Revision, 1897 (p. 86), and other writers followed him, there are several erroneous references in the literature, now belonging to *nigra*, new species. Townsend in his original description mentioned three males from District of Columbia and a female from Iowa. I examined the three male types at the University of Kansas; the female was not there. Two of the males are the species herein described: the other is *euchenor* Walker. As I spread the genitalia, and the characters are very distinct, there is no doubt whatever about this conclusion. I restrict the species by excluding *euchenor*. The two species are the largest and most robust of the genus in the nearctic region, as far as known.

The species agrees in size and most characters remarkably with *brassicaria*, but has a wider and darker abdomen. The red on the sides of the abdomen is not sharply defined, and the broad, changeable and rather vague white or silvery pruinosity helps to conceal the change of ground color. In most of the specimens of both sexes the fourth principal segment bears only two pairs of marginal bristles, although in some cases there are three. This seems to be a very good character for separating the females from related species. There is usually a distinct third sternopleural bristle below the anterior. The parafacial is considerably wider than the widest portion of the third antennal joint. The face has a considerable keel above and is decidedly concave in profile on the lower part. The fifth sternite has only a shallow median excision, the two sides of which bear erect spiny hairs in a minute comb beginning a little distance from the middle. The posterior forceps are long, united to tip, very soft in structure, pale yellow or whitish in color, with a considerable enlargement at the base, suddenly diminishing at middle. The tip is closely applied as usual to the anterior forceps, reaching almost to their extremity. The anterior forceps are shining black, grooved at the bend, and curved forward somewhat irregularly from near the base with a rather blunt point, which seems variable as in other grooved forms from becoming a little twisted in drying. We have no other species at all close to this. The last genital segment of the female is globose, with the usual two symmetrical hooks

which are small and turned up very close to the apical angle in profile. It does not have any groups of short spines below.

Length, 9 to 11.5 mm.

Redescribed from 156 specimens of both sexes.

In the National Museum: Fifty-nine specimens from District of Columbia and adjacent Maryland and Virginia, collected by McAtee, Jackson, Viereck, Quinter, Greene, Shannon, Rohwer, Clemons, Aldrich, Crawford, Townsend, Knab, and Walton; 7 from Harrisburg, Pennsylvania and vicinity (Walton); others from Chesapeake Beach, Maryland (Townsend); Tazewell, Virginia (Jackson); Calhoun F., South Carolina (Titus); Miami Beach, Florida (Snyder); Tennessee; Lafayette, Indiana (Aldrich); Marion County, Indiana (Dietz); Algonquin, Illinois (Nason); Mound, Louisiana (Jones); Onaga, Kansas (Crevecoeur); Dallas, Texas (Jones); Wolf City, Texas (Bishopp). In all 80 specimens.

In the Canadian Collection: Eleven from Teulon, Manitoba (Hunter); 1 from Pelican Lake, Manitoba (Criddle); 1 from Fort Coulonge, Quebec; 3 from Lawrence, Kansas (Curran).

In the Kansas Collection: Atchison, Douglas, Leavenworth, Lyons, Chase, Johnson, Coffey, Marion, Smith, Allen, and Osage Counties, Kansas, collected by Beamer, Bare, Breaker, Brown, and Darby; Brookings, South Dakota (Aldrich); Ames, Iowa; Knoxville, Tennessee (Summers); Canada; Illinois (Forbes); District of Columbia. In all 56 specimens.

In Professor Hine's Collection: Five specimens from Vinton and Ira, Ohio (Hine); and Newark, Ohio (Osburn).

CYLINDROMYIA EUCHENOR Walker

(Figs. 8, 31)

Ocyptera euchenor WALKER, List. Dipt. Brit. Mus., vol. 4, 1849, p. 695.

Ocypterodes euchenor TOWNSEND, Proc. U. S. Nat. Mus., vol. 49, 1916, p. 631.

Townsend designated *euchenor* Walker as type of his genus *Ocypterodes*; the specimen so labeled by him belongs to the species herein described as new under the name *vulgaris*. For *euchenor* as reared from a Pentatomid by Caffrey and Barber, see *armata*.

The species here selected as the true *euchenor* is the one agreeing with the type, as made out by Major Austen from my key and some numbered specimens that I sent him (his letter October 14, 1923).

It is strikingly similar to *argentea* in almost every detail, but easily recognizable by the male genitalia and the females can also be separated without any difficulty. In the male the posterior forceps are soft and swollen, subglobose, almost white, with a minute beak on the anterior side at the tip, between the anterior forceps. The soft cushionlike swelling of the posterior forceps is very remarkable. There seems to be no separation between the forceps

although there is a deep groove. The anterior forceps are shining brown, large, considerably curved forward toward the apex and they have on the posterior and inner edge a groove beginning at the tip of the posterior forceps and extending nearly to their own apex. The thin margins of this groove curve slightly up or down, considerably changing the shape of the organ. The fifth sternite has a wide excision, with a cluster of hairs each side, and outside of this another excision beyond which are about three bristles. This is practically the same in *argentea*. The female can be distinguished by the character given in the table—the terminal hooks of the last genital segment being attached below a square shoulder with which they are nearly parallel in profile. There are no special groups of spines on the venter.

Length, 9 to 11.5 mm.

Redescribed from 35 specimens, of both sexes. Of these 26 are in the National Museum, including 16 from the District of Columbia and adjacent parts of Maryland and Virginia, collected by Townsend, Currie, Quinter, Shannon, Crawford, and Walton. The rest are from Franconia, New Hampshire (Townsend); Ohio (Reinhard); Union Springs, New York (Anderson); Clementon, New Jersey (Johnson); White Springs, Florida (Townsend); College Station, Texas (Reinhard); Galveston, Texas (Trotter); Boulder, Colorado (Cockerell).

In C. W. Johnson's collection are five specimens, from Provincetown, Massachusetts (Morse); Durham, New Hampshire (Bridwell); Manomet, Massachusetts (Johnson); Monmouth, Maine (Frost), and Wellesley, Massachusetts (Morse).

In Professor Hine's collection are three specimens, from Hinckley, Ohio (Hine); Bluffton, Indiana (Williamson), and Golden, Colorado (Hine).

In the California Academy of Sciences is one specimen from San Marcial, Socorro County, New Mexico (Duncan).

In the University of Kansas collection are 9 specimens, from Connecticut (Williston); Illinois (Forbes); South Illinois; Ithaca, New York; Ames, Iowa; Pennsylvania; Minnesota, and Galveston, Texas (Snow).

CYLINDROMYIA ALTICOLA, new species

(Figs. 13, 24)

The only North American species at present known in which the abdomen is entirely shining without any pollinose markings. Frontal stripe decidedly red, at the middle about three times as wide as either parafrontal, the latter and the parafacial silvery; the parafacial at narrowest is hardly wider than the third antennal joint.

Antennae rather small, blackish, the arista short. Thorax black, with a distinct pollinose spot on the humerus extending almost to the suture, and on the sides with silvery pollen on all of the coxae and extending vaguely above the first and second ones. Sterno-pleural 2, with an additional small one on one side in 1 male. Abdomen broadly dark red on the sides. Wings rather narrow, evenly infuscated from front to back; the fourth vein with a long branch at its bend, its last segment far from the apex of the wing.

Male.—Claws and pulvilli all elongated, second principal segment of the abdomen a little swollen along the median line below, the third segment with a flattened V-shaped opening toward the genitalia. Genital segment blackish, the hind forceps united, of rather soft texture, deeply grooved behind, straight almost to the apex, where they bend sharply forward and are not very sharp. Anterior forceps concealed by a long swollen yellow lobelike expansion of the side of the last genital segment, so that only the tips, which are strongly bent forward and rounded, not sharp, are visible. Front tarsi plain.

Female.—Front tarsi elongated and distinctly flattened beginning with the second joint. The second principal segment of the abdomen a very little swollen on the under side, somewhat less than in the males. The genital segments black, the last one ending with a rather square shoulder which bears an almost imperceptible tooth, there being no hooklike structure developed.

Length, 6 to 7 mm.

Described from two males and two females collected at Marshall Pass, Colorado, by the writer on July 28, 1908, at an altitude of 10,856 feet.

One of the females possesses very minute but unmistakable palpi.

Type.—Male, Cat. No. 28280, U.S.N.M.

CYLINDROMYIA NANA Townsend

(Figs. 14, 19, 20)

Odontocoptera nana TOWNSEND, Journ. New York Ent. Soc., vol. 23, 1915, p. 233, female.

The parafrontals and parafacials silvery, the brown frontal stripe about as wide in the middle as the width on both sides combined. Parafacial almost twice as wide as the third antennal joint; the position of the eye a very little more vertical than usual. Thorax with considerable silvery pollen, viewed from behind there is a broad black stripe outside the dorsocentrals before the suture and a slender stripe on the inner side of the same bristles which does not reach the suture. The abdomen varies a good deal in the amount of pollen that it shows and the red portion varies in extent but tends

to cover most of the second and third principal segments. Sometimes the median black stripe is absent.

Male.—Last genital segment varying from red to black, the posterior forceps yellow, shining, apparently united, ending in a sharp point; outer forceps of the same color, rounded at tip, straight. Margin of last genital segment thin and shining yellow, projecting about as far as the tips of the posterior forceps in a broad lobe; penis longer than usual, slender in the middle, enlarged apically; fifth sternite so retracted as to be practically invisible.

Female.—The first principal segment of the abdomen bears four bristles on the hind edge where the corners come together at the middle of the venter, the second segment on the median ventral portion has a transverse protuberance somewhat arcuated, bearing numerous, very short, stiff spines. The third segment has an oval basin-shaped concavity on the middle ventral line into which the hook folds; the fifth apparent segment of the abdomen is elongated and conical, covered with short, retrorse hairs; the terminal genital segment is small, composed chiefly of the elongated hooks, which are unsymmetrical in shape, the left one being strongly constricted at the base, bulging beyond this region; the right one is stout at the base and the cavity which ordinarily lies in a symmetrical position between the two hooks is in this case thrown up along the side of the larger hook. Townsend's type specimen and one from Southern Pines, North Carolina, are the only females we possess that have two hooks; 15 other females differ only in having the left hook broken off at the base, the fractured portion is exceedingly slender and lies along the edge of the median cavity, the stinglike ovipositor so characteristic of this group lies in a groove along the side of the remaining, or right-hand hook.

Length, 5.5 to 8 mm.

Redescribed from 46 specimens (29 males, 17 females). H. J. Reinhard collected 20 males and 12 females at College Station, Texas, and this lot enabled me to feel certain that the two sexes belong together. In Professor Melander's collection are 2 males from Wawawai, Washington, collected by him.

In the Kansas collection are 3 males from Santa Rita Mountains, Arizona (Snow).

The remainder are in the National Museum as follows: 1 female with both hooks, the type, collected by Townsend at Head of Rio Piedras Verdes, Sierra Madre, Chihuahua, Mexico; 1 female, with both hooks, Southern Pines, North Carolina (Manee); 2 females, Claremont, California (Baker); 1 male, 1 female, Moscow, Idaho (Aldrich); 1 male, Lewiston, Idaho (Aldrich); 1 male, Devil's River, Texas (Bishopp); 1 male, Kerrville, Texas (Pratt).

CYLINDROMYIA ATRA Roeder

(Figs. 11, 29)

Ocyptera atra RÖDER, Stett. Ent. Zeit., 1885, p. 344.—VAN DER WULP, Biologia, Dipt., vol. 2, 1903, p. 450.—GIGLIO-TOS, Ditt. del Messico, vol. 3, p. 3, 1894 (Mem. R. Accad. Sci. Torino, ser. 2, vol. 44.)

Ocyptera minor RÖDER, Stett. Ent. Zeit., 1885, p. 344.

A large shining black species without red on the abdomen. Three sternopleurals. Abdomen with two silvery, pruinose cross-bands, the posterior one including most of the third segment; fourth segment shining black with eight bristles.

Male.—Fifth sternite with a narrow excision in the center, on each side of which is a slight prolongation followed by an emargination, beyond which at the side are a couple of flattened spines; second principal tergite of the abdomen with two or three pairs of long depressed bristles at the hind corners below next to the median line. Genital segments dark brown or black. Posterior forceps united, soft, deeply grooved behind in profile, of uniform width almost to their tip, then drawn out in a point on the anterior edge. Anterior forceps shining brown, rather broadly and evenly curved forward with a rather sharp apex.

Female.—Similar to male, the abdomen in profile rather deeper, not provided with a special group of short spines. Genital segments shining black, the last one piceous on the upper side, sloping rather gradually toward the hooks which are large and long, moderately divergent and curve gently forward. Front tarsi not perceptibly flattened.

Length, 9 mm.

Redescribed from 1 male from Porto Rico (W. V. Tower) in the United States National Museum, and 1 female from the American Museum of Natural History, collected at Barros, Porto Rico.

CYLINDROMYIA BAKERI, new species

(Fig. 5)

Male.—Very similar to *atra*, but readily distinguished by the character given in the table. In the single specimen the abdominal bands are narrower and more sharply defined, especially the posterior one. The genital segments are brown, the posterior forceps of the same color are chitinized, very short and rather bluntly pointed. The anterior forceps are shining brown and broader on the basal part than in any other known species. They are bent but little forward and have a broadly rounded apex; the fifth sternite is rather broadly emarginate in the middle and deeply excavated outside of this.

The female is unknown, but I have ventured to assume that it can be distinguished by a silvery spot above the posterior thoracic spiracle as in the male.

Length, 9 mm.

Described from a single specimen collected at Havana, Cuba (Baker). Named after the collector, Dean C. F. Baker, of Los Banos, Philippine Islands, as a slight recognition of his life-long activity in collecting tropical insects, and his generosity in placing his material at the disposal of taxonomists everywhere.

Type.—Male, Cat. No. 28281, U.S.N.M.

CYLINDROMYIA VULGARIS, new species

(Fig. 28)

This is a medium-sized species with brightly marked abdomen, very common through the western part of the United States, more rarely occurring in the region of Washington, District of Columbia. The red markings of the abdomen are very distinct, the median black stripe often lacking. The distinctive characters are given in the key and those of the male are most easily made out. The forceps are almost exactly as figured for *atra*. The posterior forceps are shining brown or black on the sides, widening at the apex. As usual, they are united and deeply grooved behind. In profile they are of about uniform width to the tip, where they end in a small toothlike projection closely applied to the anterior forceps. The latter are shining brown or black, the hind edge broadly curved forward, not grooved at the bend, the width nearly uniform for most of the length, the front edge curving forward beyond the middle to a rather sharp tip. The projecting edge of the last genital segment is not very prominent; the fifth sternite has a narrow notch in the center with a considerable lobe each side, beyond which there is a deep, rounded excavation, and at the lateral margin three flattened bristles of increasing size. The second principal segment of the abdomen has on the under side at the posterior corners two or three pairs of depressed long bristles. The fourth segment has about eight marginal bristles. In profile the eye is as far from the front edge of the head as from the hind edge. There are three sternopleurals in the female, the abdomen is without any characteristic cluster of ventral spines, and the depressed bristles of the hind edge of the second segment below are small and inconspicuous. The hooks of the last genital segment are large and strongly curved, but there is no square shoulder above their origin.

Length, 7 to 9 mm.

Described from 143 specimens of both sexes.

In the National Museum are 47 specimens, of which 15 are from the District of Columbia and the adjacent parts of Maryland and Virginia, collected by Greene, Currie, McAtee, Walton, Townsend, and Rohwer. The remainder are from Chesapeake Beach, Maryland (Shannon); Colonial Beach, Virginia (Silver); Michigan City, Indiana (Aldrich); Cadet, Missouri (Riley coll.); East Point,

Louisiana (Bishopp); Brookings, South Dakota, and Minot, North Dakota (Aldrich); Colorado; Denver, Colorado (Jackson); North Cheyenne Canyon, Colorado (Champlain); Binford, North Dakota (Mabbott); Quinlan, Texas (Bishopp); Austin, Texas (Melander); Socorro, New Mexico (Williston); Tempe, Arizona (Caffrey); Ormsby County, Nevada (Baker); Moscow, Idaho (Aldrich); Pullman, Spokane, and Fishtrap Lake, Washington (Aldrich); Wenatchee, Washington (Melander); Bead Lake, Newport, Washington (Lane); Vernon, British Columbia (Treherne); Yosemite, California (Westcott); Visalia and Los Angeles, California.

In the Kansas collection are 32 specimens, of which 15 are from Douglas, Decatur, Pratt, Marion, Johnson, Anderson, Clark, McPherson, Smith, and Linn Counties in Kansas; collected by Williams, Snow, Beamer, Martin, and Hoffman; the other are from Rock Creek, Kansas (Moodie); Illinois (Forbes); southern Illinois (Robertson); Santa Rita Mountains, Arizona (Snow); Bailey, Colorado; Montana; California and Washington Territory.

In H. J. Reinhard's collection are 23 specimens from College Station, Texas, and 3 from Dallas, Texas, all collected by himself.

In the California Academy of Sciences are 25 specimens, of which 21 are from localities in California—Yosemite Valley, Strawberry Valley, Vivian Park, Clayton, Mineral King, Davis Creek, Buck Creek, Mendocino County, Stockton, Panoche Hills, and San Diego, collected by Van Duzee, Van Dyke, Fox, Leach, and Blaisdell. The other four are from Garfield, Logan, and Salt Lake City, all in Utah, and collected by Van Duzee.

In C. W. Johnson's collection are two specimens; 1 from Stamford, Connecticut (Morse), the other from Cranbrook, British Columbia (Garrett).

In the Canadian collection are 8 specimens, all from British Columbia, as follows: Victoria, William Head, and Saanich District (all by Downes); Vernon (Cutler); Oliver (Vroom, Buckell); Penticton (Treherne); Lillooet (Anderson).

Type.—Male, Cat. No. 28282, U.S.N.M., from Falls Church, Virginia (Greene); allotype female from Great Falls, Virginia (Currie).

CYLINDROMYIA DECORA, new species

(Figs. 12, 30)

This species is strikingly similar to *vulgaris*, but seems to occur more eastward and can be readily separated, at least in the male, by the characters given in the table. The second abdominal segment has rather smaller bristles at the lower hind corners. The fifth sternite is the same. The posterior forceps are more white in color, noticeably shorter and in profile thicker than in *vulgaris*. The

anterior forceps are more strongly curved forward, beginning to taper at about the middle and have on the hind edge, somewhat before the tip, a distinct groove on the inner side.

The female, if I have associated it correctly, has on the last genital segment a square shoulder on each side at the lowest edge of which a strong upcurved hook originates which is directed more forward than in *euchenor*. The presence of dark hairs on the occiput on each side of the center above seems to distinguish the species from *vulgaris*.

Length, 7 to 9 mm.

Described from 40 specimens of both sexes.

In the National Museum are 11 specimens, from Franconia, New Hampshire (Townsend); Ithaca, New York (Anderson); Fishkill, New York (Kalmbach); Ann Arbor, Michigan (Anderson); Pennsylvania (Walton); Missoula, Montana; Pollock, Idaho (Aldrich); Chevy Chase Lake, Maryland; and Mojave, California.

In C. W. Johnson's collection are 5 specimens, from Colebrook, Connecticut (Wheeler); Rutland, Vermont; Niagara Falls, New York; Delaware County, Pennsylvania; and Point Antonio, Jamaica (last 4 by Johnson).

In J. S. Hine's collection, 1, "G. W. Lake" (Osburn).

In the California Academy of Sciences is 1, from Pleyto, Mendocino County, California (Van Duzee).

In Professor Melander's collection are 3, from Waubamick, Ontario (Parish); Chicago, and Hayti.

In the Canadian collection are 6; 3 from Jordan, Ontario; the others from Ottawa, Ontario (Beaulne); Jordan, Ontario (Ross); and Osoyoos, British Columbia (Anderson).

In the Kansas collection are 13 specimens, from Barton, Ness, and Clark Counties, Kansas (Williams); Champaign County, Illinois (Snow); Illinois (Forbes); Ithaca, New York; near Lander, Wyoming (Moodie); and California; "Brooks."

In the American Museum of Natural History are 2, from Santa Rosa Island, California (Wheeler).

Type.—Male, Cat. No. 28283, U.S.N.M., from Franconia, New Hampshire; the allotype female is from Pollock, Idaho.

The females are very close to *armata*, and I fear may not all separate on the sternopleural character.

CYLINDROMYIA ARMATA, new species

(Figs. 9, 26)

Ocyptera carolinae GREENE, Proc. U. S. Nat. Mus., vol. 60, 1922, art. 10, p. 11, fig. 20, puparium.

Parafrontals and parafacials silvery, the latter much wider than the third antennal joint, the former very narrow to the vertex.

Sternopleurals three; in the male the posterior forceps are soft and rather short, somewhat thick in profile, united and deeply grooved behind, varying in color from almost white to brownish. The anterior forceps are the most characteristic feature of this species, being rather broad at base and still more so toward the apex, where they are almost obliquely truncate, with a rounded point on the front edge; the fifth sternite has a notch in the middle separating two small lobes and beyond these at the sides two or three somewhat flattened small bristles. On the venter close to the middle line there are two or three pairs of bristles on the hind corners of the tergite of the second segment. In the female the hooks at the tip of the last genital segment are directed more straight forward than in other species and there is no shoulder at their base. The abdomen is destitute of groups of special short spines on the venter.

Length, 7 to 9 mm.

Described from 26 specimens of both sexes.

In the National Museum are 13 specimens, from Bethayres, Pennsylvania (Harbeck); Rock Creek, District of Columbia (Townsend); East Falls Church, Virginia (Rohwer); Chesapeake Beach, Maryland (Shannon); Beaver Creek, Montana (Hunter); Brockton, Montana (Sperry); Boulder, Colorado (Cockerell); Pueblo, Colorado (Wetmore); Northern New Mexico (Weese); Socorro, New Mexico (Williston); Maxwell, New Mexico (Barber); Mouth of Bear River, Utah (Wetmore), and Rocky Ford, Colorado, puparium found in beet field (McMillan).

In C. W. Johnson's collection are 5 specimens, from Cohasset, Massachusetts (O. Bryant); Anglesea, New Jersey (Johnson); and Colorado (Baker).

In the California Academy of Sciences are 3 specimens, from Garfield and Saltair, Utah, and Panoche Hills, Western Merced County, California, all collected by E. P. Van Duzee.

In the Kansas collection are 5 specimens, from Douglas County, Kansas (Snow); Beaver Creek, Montana (Hunter); Creede, Colorado (Hunter); and New Jersey (Johnson).

Type.—Male, Cat. No. 28284, U.S.N.M., from Chesapeake Beach, Maryland. The allotype female is the one from Rock Creek, District of Columbia.

The puparium of the Rocky Ford specimen, a female, was figured by Greene under the name *Ocyptera carolinae*. I correct the identification from the adult.

CYLINDROMYIA SIGNATA Townsend

(Fig. 18)

Apinocyptera signata TOWNSEND, Insecutor Ins. Menst., vol. 3, 1915, p. 94.

This is a large dark, tropical species, known only in the female, which has very peculiar genitalia. Parafacials silvery, the para-

frontals slightly yellow, a double pollinose spot between the vertical bristles behind the ocellar. The front and lower part of the head appears to be yellow in ground color, the parafacial is considerably wider than the third antennal joint. First and second joints of antennae and base of third yellowish. Sternopleural two. First principal segment of the abdomen entirely black, except the very narrow hind edge above; second segment broadly yellow on each side, its ventral part strongly projecting, with numerous very short stubby spines on the swollen portion, which forms a flattened area extending back upon the following segment; third and fourth segments reddish, nearly covered with a very thin whitish pruinosity. The spines on the fourth segment become irregularly discal in the middle; the fifth segment bent forward and under the abdomen, long and conical, reddish-brown in color, covered with short, stiff, retrorse hairs; the last genital segment small on the basal portion, being mostly developed into a single, very large up-turned, curved holding organ, which is on the right side of the apical opening and has on its mesal side a very distinct groove for the reception of the stinglike ovipositor. This apical opening occupies a sloping position upon the base of the prolongation or hook, and I can see no indication of a broken off left hook, such as would occur in *nana*. It is possible, however, that such a hook may have been present when the specimen emerged. Front tarsi normal; claws and pulvilli small. Wings more yellow than brown except around the first posterior cell, from the costa to the hind crossvein.

Length, 10.6 mm.

Described from a single female specimen taken at Gualan, Guatemala, by W. P. Cockerell (Mrs. T. D. A. Cockerell).

Type.—Female, Cat. No. 49960, U.S.N.M.

The species *nana* connects this form with the ordinary typical members of the genus *Cylindromyia* so well that at least until the male is known I think it not expedient to recognize the genus *Apinocyptera*.

CYLINDROMYIA UNIFORMIS, new species

(Fig. 4)

This species is almost like *euchenor*, but is somewhat smaller and differs quite decidedly in the shape of the fifth sternite, which certainly must be a specific character. In *uniformis* the median excision of the fifth sternite is narrow, only a little rounded at its base, and on each side of it there is a rather elongated, narrow lobe bearing a few hairs. This lobe forms a rather acute angle with the margin of the sternite laterally, and this margin bears at a little distance three erect bristles of which the hindmost is the largest.

The posterior forceps are smaller and a little less swollen than in *euchenor* but of the same general pattern. The outer forceps are also smaller and a little less robust. In both species the hind edge of the forceps is grooved at the base.

Length, 6.5 to 9 mm.

Described from 2 males; 1 in the National Museum collection is from San Jacinto, Mexico, Federal District, collected by E. G. Smyth; the other in C. W. Johnson's collection from San Dominica, West Indies.

Type.—Male, Cat. No. 28285, U.S.N.M.

Paratype in C. W. Johnson's collection.

CYLINDROMYIA LIMBATA, new species

(Figs. 6, 21)

Male.—Parafacials and parafrontals slightly yellowish, the former as wide as the third antennal joint, the latter narrow above; antennae reddish-brown almost to arista. Mesonotum and scutellum with a decided brassy and metallic reflection. Sternopleurals three. Abdomen rather brownish in color throughout, the second and third segments only a little reddish on the sides; the suture between them narrowly and sharply bordered with white pollen; the third segment with the pollen much more extended; fourth segment with eight bristles; fifth segment with one strong pair directed backwards. The last genital segment mostly yellow, the genitalia greatly resembling those of *nana*, the hind forceps minute, yellow, shining, slender, about two-thirds as long as the anterior, which are also yellow and shining, straight with broadly rounded tip. The margin of the last genital segment is also shining yellow, and projects enough to partially conceal the forceps. Fifth sternite with wide and extremely shallow emargination along the center, at the sides, however, with the usual row of three bristles increasing in size on a slight prominence. Wings brown along the veins and on the anterior part. The discal and first posterior cells much lighter in the middle, the brown color following the veins with quite uniform width. Tibia rather dark red (the only species known with this character); claws and pulvilli elongated.

Female.—The specimen is teneral so that the dark border on the wing veins is only suggested. The second principal segment of the abdomen has on the median line below, just before the middle, a slight swelling with numerous small and somewhat stubby spines, much less distinct than in *nana*. The fifth segment is reddish, elongated, conical, covered with rather dense retrorse hair. The last segment consists almost entirely of the hooks, which are shining black, the right one stout at the base, slightly notched in profile

beyond the middle; the left one deeply grooved at the base as in *nana* and swollen on the outer side beyond the groove.

Length, 7 to 8 mm.

Described from 2 males and 1 female, the males from the California Academy of Sciences, were collected at Mill Creek Canyon, San Bernardino County, California, by E. P. Van Duzee. One of them is retained for the National Museum collection. The female was collected at Atencingo, Mexico, by E. G. Smyth.

Type.—Male, Cat. No. 28286, U.S.N.M.; paratype, male in California Academy of Sciences.

LIST OF DESCRIBED SPECIES OF CYLINDROMYIA FROM NORTH AMERICA, NOT HEREIN IDENTIFIED

(All heretofore mentioned under *Ocyptera* except as noted. The types will have to be reexamined before the species can be identified; in the case of *carolinae* this is impossible, as no types are in existence.)

binotata BIGOT, Annales Soc. Ent. Fr., 1878, p. 44, female.—Baltimore.

carolinae ROBINEAU-DESVOIDY, Myodaires, 1830, p. 232 (Parthenia).—Carolina.

COQUILLETT, Revis. Tachin., 1897, p. 86.—Massachusetts to California, etc.

A mixture of several species; the following references are based on Coquillett's key and equally uncertain.

ALDRICH, Annals Ent. Soc. Amer., vol. 8, 1915, p. 82.—Widespread.

CREVECOEUR, Kans. Acad. Sci., vol. 20, 1906, p. 93.—Kansas.

Also reported from New Jersey, Florida, and Jamaica (Johnson); Ontario (Gibson); Quebec (Fyles, and Winn and Beaulieu); British Columbia (Hine); Minnesota (Washburn); California and Nevada (Baker); Kansas (Snow); Montreal (Chagnon); Illinois (Hart); North Carolina (Brimley); Connecticut (Britton).

dotadas WALKER, List, vol. 4, 1849, p. 694.—Jamaica.

epytus WALKER, List, vol. 4, 1849, p. 694.—Georgia.

fumipennis BIGOT, Annales, 1878, p. 43, male.—Colorado.

BRAUER, Sitzungsber. Kais. Akad. Wiss. Wien., vol. 107, 1898, p. 1, note on type.

signatipennis VAN DER WULP, Tijdsch. v. Ent., vol. 35, p. 187; Biologia, Dipt., vol. 2, 1903, p. 450. pl. 13, fig. 11.—Guerrero, Mexico.

simplex BIGOT, Annales, 1878, p. 47, female.—Mexico.

soror BIGOT, Annales, 1878, p. 46.—Mexico. (The name is preoccupied.)

BRAUER, Sitzungsber. Kais. Akad. Wiss. Wien, vol. 107, 1898, p. 1, note on type.

EXPLANATION OF PLATE

(Figures 2, 3, 7, 8, 12, 22, 31, by C. Howard Curran; 19, 20, by R. E. Snodgrass. The remainder by the author)

PLATE 1

(Figs. 1-14 are male genitalia, side view, generally only the posterior and anterior forceps being drawn. Variously magnified)

FIG. 1. *Cylindromyia brassicaria* Fabricius.

- | | | |
|-----|---|---|
| 2. | " | <i>intermedia</i> Meigen. |
| 3. | " | <i>argentea</i> Townsend. |
| 4. | " | <i>uniformis</i> , new species. |
| 5. | " | <i>bakeri</i> , new species. |
| 6. | " | <i>limbata</i> , new species (imperfectly drawn out). |
| 7. | " | <i>dosiades</i> Walker. |
| 8. | " | <i>euchenor</i> Walker. |
| 9. | " | <i>armata</i> , new species. |
| 10. | " | <i>nigra</i> , new species. |
| 11. | " | <i>atra</i> Roeder. |
| 12. | " | <i>decora</i> , new species. |
| 13. | " | <i>alticola</i> , new species. |
| 14. | " | <i>nana</i> Townsend. |
| 15. | Scutellum with three pairs of bristles. | |
| 16. | Scutellum with two pairs of bristles. | |
| 17. | Scutellum with one pair of bristles. | |

(Female genitalia from the side (19 and 20 diagonally from below).)

FIG. 18. *Cylindromyia signata* Townsend.

- | | | |
|-----|---|--|
| 19. | " | <i>nana</i> Townsend, with both hooks intact. |
| 20. | " | <i>nana</i> Townsend, with one hook broken off, the usual condition. |
| 21. | " | <i>limbata</i> , new species. |
| 22. | " | <i>dosiades</i> Walker. |
| 23. | " | <i>compressa</i> , new species. |
| 24. | " | <i>alticola</i> , new species. |
| 25. | " | <i>intermedia</i> , new species. |
| 26. | " | <i>armata</i> , new species. |
| 27. | " | <i>argentea</i> Townsend. |
| 28. | " | <i>vulgaris</i> , new species. |
| 29. | " | <i>atra</i> Roeder. |
| 30. | " | <i>decora</i> , new species. |
| 31. | " | <i>euchenor</i> Walker. |
| 32. | " | <i>nigra</i> , new species. |





Aldrich, John Merton. 1926. "North American two-winged flies of the genus *Cylindromyia* Meigen (Ocyptera of authors)." *Proceedings of the United States National Museum* 68(2624), 1-27.

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