

American Museum Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK 24, N.Y.

NUMBER 1696

DECEMBER 15, 1954

New Species and Notes on Flies Belonging to the Genera *Rhaphiomidas* and *Apiocera* (Diptera, Apioceratidae)

BY MONT A. CAZIER¹

When this paper was begun, it was thought that, in view of the large amount of new material available since the author's review of the family (1941), a revision would be possible. However, as work progressed, it soon became apparent that it would be desirable to await further material and an opportunity to study the internal features of the male genitalia. Even though most of the material in collections has been available for study, it is still impossible definitely to establish the correct relationships of several species. The range of variability and distribution of a number of species have been expanded to such a point as to invalidate the original definition of the populations. The ventral view and the lateral lobes of the ninth tergite of the male terminalia have in the past been used as the basic character for separating most of the species in *Apiocera*. It is now known that there is considerable variation in this character, and in several species illustrated differences are no longer definitive of the populations.

An exploratory examination of the genitalic structures contained within the ninth abdominal segment in several species of *Apiocera* indicates that there are good group and specific differences. A detailed study of these structures is beyond the scope of the present paper but it seems desirable at this point to indicate a group difference that seems to be correlated with group differences that have been based on the color pattern of the

¹ Chairman and Curator, Department of Insects and Spiders, the American Museum of Natural History, New York.

abdomen. In the lineate group (*bilineata*, *mexicana*, *sonorae*, *infinita*) there is a dense pad of black hair on the upper surface of the inner apical fold of the ninth tergite. In the rest of the species examined (*haruspex*, *pearcei*, *hispida*, *parkeri*, *aldrichi*, *caloris*, *augur*, *alleni*) there is no dense pad of black hair on the inner apical fold of the ninth tergite.

Although this paper is concerned only with species occurring in the Western Hemisphere, it seems appropriate to include a few general comments on a recent contribution by S. J. Paramonov (1953). In his excellent review of the Australian species, Paramonov changes the generotype from *A. fuscicollis* Westwood as designated by Coquillett (1910) to *A. asilica* Westwood, stating that the latter has priority, "being described as 'sp. 1' by Westwood, whereas *A. fuscicollis* was accepted by Westwood with some doubt as a species distinct from *A. asilica* as indicated by the words 'An varietas praecedentis?'" Under the original description of the genus by Westwood (1835, pp. 448-449) both *A. asilica* and *A. fuscicollis*, in that order, were assigned to the genus. It is true that Westwood questioned the specific distinctness of *A. fuscicollis* from *A. asilica*, but he did not express any doubt that it belonged correctly to the genus *Apiocera*. He did not, however, designate either species as generotype. This was done by Coquillett (1910) who stated "Type, *Apiocera fuscicollis* Westwood, the second species, by present designation." In accordance with the Rules of Zoological Nomenclature, if an author, in publishing a genus with more than one valid species, fails to designate or to indicate its type, any subsequent author may select the type, and such designation is not subject to change (type by subsequent designation). In view of the facts that the type specimens of both species are in existence, although in poor condition, Westwood did not designate either as the generotype, he did not question the generic placement of either species, and Coquillett definitely designated *A. fuscicollis* Westwood as the generotype, Paramonov was not justified in making *A. asilica* the generotype. That Westwood apparently questioned the specific distinctness of *A. fuscicollis* from *A. asilica* and that the latter was listed as "sp. 1" do not in any way invalidate Coquillett's selection of *A. fuscicollis* as the generotype. In making this selection Coquillett may have been influenced by the fact that the type of *A. asilica* was in a very mutilated state, as admitted by Westwood in 1841. Judging from Paramonov's paper, the type of *A. fuscicollis* is also unrecognizable, according to the staff at the British Museum.

There is considerable question of Paramonov's treatment of *A. asilica* in the text and more especially because the type, although in poor condition, is still in existence. *Apiocera fuscicollis*, while discussed briefly

under *A. asilica*, is neither placed in synonymy nor treated as a species. I believe that any definite conclusions concerning the validity of these two species should await the time when a specialist in this family, such as Paramonov, with adequate Australian material can examine and compare specimens with the types.

The writer wishes to express his appreciation to the following individuals for the loan of material from their collections or from collections in their charge: Dr. E. L. Kessel, California Academy of Sciences, San Francisco, California; Dr. Paul D. Hurd, Jr., University of California, Berkeley, California; Mr. A. T. McClay, University of California, Davis, California; Mr. Fred S. Truxal, Los Angeles County Museum, Los Angeles, California; Dr. H. Edwin Cott, University of Utah, Dugway Proving Ground, Tooele, Utah; and Dr. Charles H. Martin, Oregon State College, Corvallis, Oregon.

KEY TO THE MALES OF *Rhaphiomidas*

1. Terminalia (lateral lobes of ninth tergite) rounded, tergites overlapping apically when closed 2
Terminalia elongate, acute apically, tergites not overlapping apically . . . 3
2. Conical swellings on the lateral lobes of the postnotum with elongate acute apical projection; third antennal segment short and strongly clavate; proboscis about three times the length of the antennae . . . *brevirostris*
Conical swellings on the lateral lobes of the postnotum without elongate acute apical projection; third antennal segment elongate, swollen medially; proboscis about five times the length of the antennae *parkeri*
3. Abdominal segments one through five black or brown in basal two-thirds, apical third pale yellow or white 4
Abdominal segments one through five not marked as above, usually either unicolorous or with median dark markings of variable shapes 5
4. Lateral lobes of ninth tergite unicolorous orange; proboscis longer than half of the length of the body *terminatus*
Lateral lobes of ninth tergite black or black medially, with narrow testaceous border; proboscis shorter than half of the length of the body . . . *trochilus*
5. Vertex with each compound eye separated from the lateral ocelli by about one-half of the width of a lateral ocellus 6
Vertex with each compound eye separated from the lateral ocelli by the width or more than the width of a lateral ocellus 7
6. Abdomen with segments two through four bordered apically with narrow, dark, transverse bands *painteri*
Abdomen with segment two dark in basal third, yellow apically, segments three and four entirely yellow. *xanthos*
7. Hind tibiae yellow or orange 8
Hind tibiae black or brown *episcopus*
8. Terminalia large and robust; gonostyles extending little more than one-half of the distance to apex of lateral lobes of ninth tergite 10
Terminalia narrow and small; gonostyles extending to about apical fourth of lateral lobes of ninth tergite 9

9. Antennal segments one and two black; under surface of thorax black; femora black or for the most part black *aitkeni*
 Antennal segments one and two brown and yellow; under surface of thorax testaceous; femora yellow *abdominalis*
10. Abdominal middorsal black markings large, often extending to posterior margin on one or more segments from one to six *maculatus*
 Abdominal middorsal black markings lacking or represented by isolated spots not reaching hind margins of segments 11
11. Sexes dichromatic *maehleri*
 Sexes monochromatic *acton*

KEY TO THE FEMALES¹ OF *Rhaphiomidas*

1. Macrochaetae of hind tibia wholly or in greater part dark brown or black 2
 Macrochaetae of hind tibiae yellow or white 6
2. Vertex highest behind the lateral ocelli; narrow between the eyes . . . *xanthos*
 Vertex highest between the lateral ocelli; wide between eyes 3
3. Abdominal segments transversely banded, black basally, testaceous or orange apically; terminal antennal segment orange (United States) 4
 Abdominal segments without regular transverse bands, segments entirely dark or with middorsal black lunate or irregular spots; terminal antennal segment dark (Baja California) *episcopus*
4. Thorax with white macrochaetae along base *trochilus*
 Thorax with black or brown macrochaetae along base 5
5. Black basal abdominal bands expanded medially towards apex . . . *abdominalis*
 Black basal abdominal bands not expanded medially towards apex . . . *terminatus*
6. Abdominal markings in the form of transverse bands; if bands are broken laterally, the middle spots become progressively larger towards the base of the abdomen 7
 Abdominal markings lacking or forming only middorsal spots *maculatus* and *acton*
7. Abdominal segments two to four yellow, with narrow, brown or black posterior margin *painteri*
 Abdominal segments two to four black, with yellow posterior margins . . . 8
8. Proboscis short, not extending to posterior margin of thorax . . . *brevirostris*
 Proboscis long, extending beyond posterior margin of thorax *parkeri* and *maehleri*

Rhaphiomidas episcopus Osten Sacken

This species has in the literature to date been described as being of a uniform black color but very few specimens have been captured. In 1941 Ross and Bohart took a series of 19 specimens in the Cape region of Baja California which indicate that the species is one of, if not the most, variable in the genus and that the population is not entirely black in color. All but six of these specimens came from the area around Todos Santos which is about 25 to 30 miles northwest of El Taste, a known locality for *R. episcopus*. One male collected at Pescadero, October 8,

¹ No females of *R. aitkeni* are available.

1941, agrees very well with the description given by Townsend except that there are two small lateral orange spots on the second abdominal segment, the first segment has the pile yellowish, whereas it is black on the remainder of the segments, and the hind tarsi are yellow. One male out of four taken 18 miles east of Todos Santos, October 17, 1941, has small lateral orange spots on segments two and three, the former being largest. A second male has the first abdominal segment bordered apically with orange, broken at middle, second and third segments with large lateral orange spots connected along apical margin, and the fourth segment has a narrow orange apical band. The abdominal pile on this specimen is mixed orange and black on segments two through four. In two additional males and four females the orange abdominal markings are very broad. Four females collected at Todos Santos, October 10, 1941, have the abdominal segments broadly banded with orange. One female from Las Animas, Sierra Laguna, October 12, 1941, is entirely black, as is *Osten Sacken's* type, but one male and two females taken with it have broad orange abdominal markings on segments one and two and sometimes narrow bands on three and four. All the males from the above localities have the terminalia and venter of abdomen clothed with black pile. Six specimens from San Pedro, October 7, 1941, 35 miles northwest of Todos Santos, have the first, fourth, and fifth segments with a narrow, orange, apical median band, wide orange band laterally, second and third segments more than half orange laterally, and with median, broad, black projections extending to apical third of segments. In addition to being broadly marked as in the Todos Santos specimens they differ as follows: mesonotal machrochaetae yellow or piceous, both upper and under surfaces of abdominal segments clothed with golden pile, base of ninth tergites golden pilose, apex with pile black, and ninth sternite golden pilose.

Structurally these five geographical samples are the same and agree with the black *R. episcopus*. Because there is every gradation in the maculations on the abdomen from completely black to being broadly maculated with orange, they are all considered as belonging to one population, *R. episcopus*. The six specimens from San Pedro are the most divergent, especially in the color of the pile, and may eventually prove to be a subspecies. However, until additional material and information on the ecology are available, they are considered as being extreme variants of *R. episcopus*.

Rhaphiomidas brevirostris, new species

Medium-sized, relatively narrow; abdominal segments bicolored; machrochaetae of hind tibiae white; gonostyles extending slightly beyond

lateral lobes of ninth tergite; vertex of head with each compound eye separated from lateral ocelli by one and one-half times the width of a lateral ocellus; terminal antennal segment strongly clavate apically, sensory area on ventral surface small and subapical; dorsal abdominal segments with posterior margins narrowly bordered with yellow; lateral lobes of ninth tergite black, inner margins and apex broadly bordered with testaceous; ninth sternite piceous at base, lateral projections testaceous; mouth parts comparatively short.

MALE: Head white pollinose, moderately densely clothed with long white hair; antennae with segments one and two black, sparsely clothed with long white hair, third segment strongly clavate, pedicle white pollinose, rounded apical half black; proboscis about three times longer than length of antennae. Mesonotum moderately densely clothed with rather long testaceous pile, gray pollinose except for median longitudinal discal black stripe and two large lateral areas, macrochaetae white, metathorax with large conical swellings on lateral lobe of postnotum in front of halteres, swelling acutely pointed towards base. Abdomen moderately densely clothed with long white hair, segments black with gray pollen, apical borders of segments narrowly testaceous. Terminalia subcylindrical, clothed throughout with long white hair, lateral lobes of ninth tergite with inner and apical margins bordered with testaceous, border widest at apex, narrowing towards base on each margin, left lobe strongly overlapping right lobe apically, apex acutely rounded. Under surface moderately densely clothed with long white pile; legs with femora black except for apex of middle and front which are testaceous, anterior and middle tibiae black on inner surface, testaceous on outer surface, hind tibiae black, anterior and middle tarsi testaceous, hind tarsi black basally, piceous apically, pulvilli large, three-quarters as long as claws, macrochaetae and pile on all legs white or testaceous. Length, 24.0 mm.; width, 7.0 mm.

FEMALE: Similar to the male but differing in the usual sexual characters, the middorsal pile on segment four is retrose as is all the dorsal pile on segments five through seven, segments one through four with narrow, apical testaceous border, segments five and six entirely testaceous, segment seven slightly darker. Length, 31.0 mm.; width, 7.5 mm.

TYPE MATERIAL: Holotype male, one male and one female paratopotypes collected at La Choya, Sonora, Mexico, June 12, 1952; allotype female, three males, and one female paratypes collected 20 miles southwest of Sonoyta, Sonora, Mexico, June 13, 1952. All specimens were collected by W. Gertsch, R. Schrammel, and M. Cazier.

The series of eight specimens were collected in dry sandy areas which were sparsely covered with low vegetation. The females were usually found resting on the sides of shrubs, whereas the males were taken either in flight or after they had found the females. While the normal flight was rather rapid, when disturbed the flies were barely visible.

Rhaphiomidas brevirostris can be separated from all other species in the genus by the short proboscis and by the acute projection on the conical swellings on the lateral lobes of the postnotum. It can be separated from all species except *R. xanthos* by the clavate third antennal segment but can be separated from this species by the fact that the compound eyes are separated from the lateral ocelli by one and one-half times the width of a lateral ocellus and that the terminalia are rounded. It appears to be most closely related to *R. parkeri* Cazier but is easily separated by the short proboscis, the acute projection on the conical swellings on the lateral lobes of the postnotum, the clavate third antennal segment, and longer dorsal pile.

Apiocera sonora, new species

Medium-sized; pteropleura without pile, pruinose throughout; dorso-caudal angle of mesopleura bare; dististyles of terminalia without a sub-apical flare of long hair; macrochaetae on femora and tibiae of legs white; terminalia dark reddish brown in color; pile on terminalia black; abdominal segments two, three, and four with narrow lateral black bands, fourth segment with slight indication of a brown incomplete lateral band.

MALE: Head with front white pruinose and pilose; antennal segments one and two white pruinose and pilose, base of third segment white, apical half piceous; palpi white pruinose and pilose. Mesonotum with pile and macrochaetae white, pruinose covering white except for two brown narrow median bands and oblique lateral bands; thorax beneath white pruinose, sparsely white pilose. Abdominal segments sparsely white pilose except for black hairs on lateral bands; lateral band on segment two not extending to base and apex, on three not extending to base, on four extending from base to apex. Terminalia beneath similar to those of *A. infinita* Cazier (Cazier, 1941, p. 612), lateral lobes of ninth tergite not notched apically. Legs with pile and macrochaetae white, pulvilli on anterior tarsi about half as long as claws, on middle and hind legs short and inconspicuous. Length, 17.5 mm.

FEMALE: Similar to the male except that mesonotal pile is brown in color; pulvilli on all tarsi very short and inconspicuous. Retrose hairs on abdominal segments four through seven white. Length, 18 mm.

TYPE MATERIAL: Holotype male and 50 male paratopotypes, allotype

female and 18 female paratopotypes collected at 20 miles southwest of Sonoyta, Sonora, Mexico, June 13, 1952, by R. Schrammel, W. Gertsch, and M. Cazier. One male paratype from La Choya, Sonora, Mexico, June 12, 1952, by the same collectors. All specimens were collected on sparsely vegetated sand hills and were found running about on the open sand between the vegetation. During the hottest part of the day they were found on the sand in the shade of the shrubs.

The series is rather uniform in most respects, although in several males there is no indication of the lateral abdominal band on the fifth segment. This band is less evident than those on the second, third, and fourth segments. In a few specimens there is an indication of a middorsal brown spot on abdominal segments two and three, and in some the dorsal hairs on abdominal segments one through four are black rather than white.

In general appearance it most closely resembles *A. bilineata* Painter but can be distinguished from it by the black pile on the terminalia, the ventral surface of the terminalia, and by not having the lateral abdominal bands on segments six and seven in the male. From *A. infinita* it can be distinguished by not having the black abdominal bands on segments six and seven, its white rather than black macrochaetae on the mesonotum and tarsi, and by the reddish brown rather than piceous terminalia. From *A. interrupta* Painter it can be separated by not having the lateral abdominal bands on segments six and seven, by having the upper margins on the bands on segments two through four nearly straight rather than convex, by the black pile on the terminalia and under surface of the terminalia.

Apiocera mexicana, new species

Medium-sized, narrow; pteropleura without pile, pruinose throughout; dorsocaudal angle of mesopleura bare; dististyles of terminalia with a subapical flare of long hair.

MALE: Head with front white pruinose and pilose; antennal segments one, two, and base of three white, apex of third segment brown; palpi white pruinose and pilose. Mesonotum brown pilose and pruinose, white laterally, macrochaetae black, thorax beneath white pruinose throughout, sparsely white pilose. Abdominal dorsum with first segment white pilose, remainder of segments with brown pile, ventral surface white pilose, segments one through seven with black lateral bands, bands on segments one through four narrowly interrupted at apex of each segment, dorsum with median black band on segments one through seven, wide on basal segments, narrowing towards seventh segment. Terminalia reddish brown, pile dark brown, lateral lobes of ninth tergite not notched

apically, ventral surface similar to that in *Apiocera bilineata* Painter (Cazier, 1941, pl. 4, fig. 13) except for subapical flare of long brown hair extending beyond apex of dististyles. Legs with coxae and femora white pilose, macrochaetae white, tibiae with both black and white pile, macrochaetae on anterior and middle tibiae primarily white, those of hind tibiae mostly black, tarsi white pilose, macrochaetae black, pulvilli almost as long as claws. Length, 15.5 mm.

FEMALE: Similar in most respects to the male except for the usual sexual differences; the lateral abdominal markings extend only to the base of the fifth segment, middorsal band through segment four; mesonotum with a few white macrochaetae; tibiae white pilose. Length, 16.5 mm.

TYPE MATERIAL: Holotype male, allotype female, collected at Veracruz, Veracruz, Mexico, June 20, 1951, P. D. Hurd, Jr., in the collection of the American Museum of Natural History. Two male paratopotypes; one male paratype collected at Tecolutla, Veracruz, Mexico, June 19, 1951, P. D. Hurd, Jr.; three male paratypes collected at Mileage 6059.5, Buen Pais Camp, Veracruz, Mexico, April 23, 1953, E. I. Schlinger; one male paratype collected at Acapulco, Guerrero, Mexico, June 16, 1935, A. E. Pritchard. Paratypes deposited in the collections of the University of California and the American Museum of Natural History. Although the single specimen collected by Pritchard was the first one received, it was considered advisable to base the species on the Veracruz sample because both sexes were represented.

This is the southernmost known species in North America. It appears to be most closely related to *A. intonsa* Cazier, to which it will key (Cazier, 1941, p. 601), but can be readily separated by the three black bands on the abdomen, shorter subapical flare of hair on the dististyles, and the black macrochaetae on the hind tibiae and tarsi. The terminalia are similar in form to those of *A. bilineata* Painter and *A. interrupta* Painter. It can be separated from both by its black macrochaetae and three black abdominal bands. It can also be separated from *bilineata* by its long pulvilli. Geographically the species is most closely associated with *A. clavator* Painter which is known only from Colima, Mexico. It can be separated, however, by its completely different terminalia (Cazier, 1941, pl. 4, fig. 9) and by the three abdominal black bands.

REFERENCES

CAZIER, M. A.

1941. A generic review of the family Apioceratidae with a revision of the North American species (Diptera-Brachycera). Amer. Midland Nat., vol. 25, no. 3, pp. 589-631.

COQUILLET, D. W.

1910. The type species of North American genera of Diptera. Proc. U. S. Natl. Mus., vol. 37, pp. 499-647.

PARAMONOV, S. J.

1953. A review of Australian Apioceridae (Diptera). Australian Jour. Zool., vol. 1, no. 3, pp. 449-536.

WESTWOOD, J. O.

1835. Insectorum nonnullorum exoticorum (ex Ordine Dipterorum) descriptiones. London and Edinburgh Phil. Mag. Jour. Sci., ser. 3, vol. 6, no. 72, pp. 447-449.
1841. Synopsis of the dipterous family Midasidae with descriptions of numerous new species. Arcana Ent., vol. 1, pp. 49-56.