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A REVIEW OF THE NEW WORLD FLIES OF THE GENUS
CONOPS AND ALLIES (DIPTERA: CONOPIDAE)

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The present study is based mainly on a fine collection of New World Conopinae that had been accumulated by R. C. Shannon and eventually acquired by the U. S. National Museum (USNM). Most of the specimens had been collected by Shannon himself at Maracaju, Mato Grosso, Brazil. He had been actively studying this material, and many manuscript names for new species are attached; but he never published on this group. Wherever possible I have used his names for the new species.

The last study of the Neotropical members of this group was by Kröber (1939, *Ann. Mag. Nat. Hist.*, ser. 11, vol. 4, pp. 454-468). In this work Kröber referred many species for the first time to *Physoconops* from *Conops*; but many species were not then available to him and their position could not be determined. Aczél (1950, *Acta Zool. Lilloana*, vol. 9, pp. 49-61) reviewed the Neotropical members of the family and assigned a few more species; and Parsons (1948, *Ann. Ent. Soc. America*, vol. 41, pp. 226-230), reviewing the Nearctic Conopidae, removed those species formerly in *Conops* to *Physoconops*. In this paper I have been able to locate most of the others, but the position of a few must still remain in doubt.

Early in the present study several structural characters were found for grouping related species. These have proved so useful

that I feel they should be recognized in subgeneric categories. Eventually most of them will prove to be of generic importance; but until a worldwide study is made, and until the family is better known, it is better to retain the present level of generic division.

Acknowledgment is made to the following individuals and institutions for the loan of specimens, information on types, and other assistance and advice. Without their generosity this work could not have been accomplished.

C. W. Sabrosky, U. S. Department of Agriculture; H. Oldroyd, British Museum (Natural History) (BM); C. H. Curran, American Museum of Natural History (AMNH); S. L. Tuxen, Universitet Zoologiske Museum, Copenhagen (UZM); H. Mayer, Naturhistorisches Museum, Vienna (NMV); E. Séguy, Muséum National d'Histoire Naturelle, Paris (MHNP); P. J. Darlington, Jr., Museum of Comparative Zoology (MCZ); R. H. Beamer and J. Hall, Snow Museum, University of Kansas; P. D. Hurd, Jr., University of California, Berkeley (UCB); and H. Dybas, E. Ray, and R. Wenzel, Chicago Natural History Museum (CNHM).

Key to genera of New World Conopinae

1. Face not grooved, sharply keeled *Tropidomyia* Williston
Face with grooves, separated by a shallow keel 2
2. Cheeks wide, equal to one-half eye-height *Mallochoconops*, new genus
Cheeks much narrower than one-half eye-height 3
3. Posterior femur thickened and angulated at base; anterior cross-vein much beyond middle of discal cell *Physocephala* Schiner
Posterior femur normal; anterior cross-vein near middle of discal cell . . . 4
4. Vertex with distinct ocellar swelling; second abdominal segment, especially in male, relatively long and narrow *Physoconops* Szilady
Vertex without ocellar swelling; second abdominal segment short and wide.

Conops Linné

Genus *Conops* Linné

Conops Linné, Systema naturae, ed. 10, p. 604, 1758.

Most of the species formerly placed here belong to *Physoconops*, which is much more common than *Conops* in the New World.

Information on the types of the following species indicates that they belong to *Physocephala*.

Conops cayennensis Macquart, Diptères exotiques, vol. 2, suppl. 3, p. 12, 1843. Cayenne. (Type in MHNP.)

Conops flavifrons Walker, List of the specimens of dipterous insects in the collection of the British Museum, vol. 3, p. 672, 1849. Pará. (Type not found.)

Conops aurifrons Walker, List of the specimens of dipterous insects in the collection of the British Museum, vol. 4, p. 1158, 1849. (Type in BM. A synonym of *C. flavifrons*.)

Conops punctum Bigot, Ann. Soc. Ent. France, ser. 6, vol. 7, p. 46, 1887. "Amér. mér." (Type in BM.)

Conops soror Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 131, 1915. México. (Type in NMV.)

The following species have not been seen, and have not been reidentified since originally described. I have not been able to locate the types. They may belong to *Physoconops* or *Physocephala*.

Conops dimidiatipennis Sichel, Ann. Soc. Ent. France, ser. 4, vol. 2, p. 120, 1862. Montevideo.

Conops ephippium Macquart, Diptères exotiques, suppl. 3, p. 11, 1847. "Amér. mér."

Conops flaviceps Macquart, Diptères exotiques, vol. 2, p. 14, 1843. "Amér. sept."

Conops sericeus Olivier, Encyclopédie méthodique, vol. 6, p. 111, 1791. Cayenne.

The remaining species, which definitely belong to this genus, fall into the following well marked subgenera.

Key to subgenera of *Conops*

1. Occiput with hornlike swellings **Ceratoconops**, new subgenus
- Occiput without hornlike swellings 2
2. Head about half as long as high; male abdomen pointed.
 - Sphenoconops**, new subgenus
 - Head more than half as long as high; male abdomen rounded. **Conops** Linné

Subgenus *Conops* Linné

Conops Linné, Systema naturae, ed. 10, p. 604, 1758.

The type of *Conops* was designated as *flavipes* by Curtis in 1831. In this species abdominal segment 2 is slightly longer than abdominal segment 3, the distal margin of the abdominal segment 2 is slightly wider than the proximal margin, and the base of segment 3 is about three-fourths its distal width.

Kröber has designated *macrorhynchus* (= *vesicularis*) as the type. In that species the shape of abdominal segments 2 and 3 is about the same, but there are usually three or four propleural bristles, instead of two or three as in *flavipes*.

The new species described below agrees with the above species in the shape of abdominal segments 2 and 3, but there is only one large and one very small propleural bristle.

Conops (Conops) verus, new species

DESCRIPTION: Male: Length 13 mm. Front dark yellow, upper third black with black vertical midline dividing at base of antennae. Vertex dark yellowish, face yellow, parafacials and lower two-thirds of grooves black with yellowish pollen. Cheeks entirely black extend-

ing upward for one-third the length of the face. Occiput black with yellow pollen on the orbitals. Antennae black, segment 1 and narrow basal margin of segment 3 reddish. Segment 1 about four times as long as wide; segment 2 twice the length of segment 1; segment 3 $1\frac{1}{2}$ times segment 1, relatively slender. Arista 3-segmented, segment 2 moderately produced laterally. Proboscis black, $1\frac{1}{2}$ times height of head.

Thorax entirely black with faint yellow pollen on the dorsum, somewhat more marked medial to the humeri and on the scutellum. Coxae black with yellowish pollen. Femora black with reddish at base and apex. Tibiae mostly reddish, tarsi mostly reddish, the distal segments more blackish, claws black, pulvilli reddish.

Wings with pattern extending to vein 3 and the vena spuria, with a narrow margin before veins 4, 5, and 6. Pattern rufous on the basal half, more blackish on the distal half, especially between veins 2 and 3 and vena spuria. Costal cell and remainder of wing nearly hyaline. Halteres reddish black, especially at the tip.

Abdomen black with narrow distal margins of golden pollen on segments 1-3. Segments 4-6 are nearly entirely covered with golden pollen. Genital segments black and reddish.

TYPE: Holotype, male (USNM 62423), Rio Claro, São Paulo, Brazil, October 1939, Claretiano.

REMARKS: This is the only true *Conops* that I have seen from the Neotropical region. Perhaps Kröber identified a specimen of this species as *hermanni* when he placed that species in *Conops*, and then redescribed *hermanni* as *perbellum* in *Physoconops*.

Conops (Conops) bermudensis Parsons

Conops bermudensis Parsons, Psyche, vol. 47, p. 28, 1940.

This species has not been seen at this time, but presumably belongs to the typical subgenus. It is a species with spots on the anterior orbital margins at the frontofacial junction. This is a frequent character among the Old World *Conops*. The only New World species with this character that I have seen is *Tropidomyia bimaculata*. This is the only member of the genus *Conops* that occurs in the Nearctic region.

Conops (Conops) pruinus Bigot

Conops pruinus Bigot, Ann. Soc. Ent. France, ser. 6, vol. 7, p. 46, 1887.

This species was described as questionably from Central America. The type is in the British Museum, and from information supplied by Oldroyd it belongs to *Conops*. It keys out to *gracilis*, but that species is a *Physoconops*. Being a *Conops*, there is a good possibility that it is not a Neotropical species.

Ceratoconops, new subgenus

This subgenus is characterized by bilateral swellings on the occiput midway between the vertex and the inferior margin of the eye. The posterior margin of the eye is markedly indented, but the triangular smooth area is not large. Only one propleural bristle is present. The abdomen of the male has segment 2 as wide at the base as at the apex. This segment is about twice as long as wide and about equal to abdominal segment 3. The proximal width of abdominal segment 3 is about two-thirds the distal width of that segment. The length of the head is nearly equal to the height of the head.

TYPE: *Conops ornatus* Williston.

Conops (Ceratoconops) ornatus Williston

Conops ornatus Williston, Kansas Univ. Quart., vol. 1, p. 46, 1892.

One cotype male labeled "Corumba, May" (in AMNH), was loaned for examination. The location of the other cotype is unknown. It is not at the University of Kansas, nor are the types there of any of the other species described by Williston at that time.

RANGE: Brazil (Mato Grosso).

Sphenoconops, new subgenus

This subgenus is most distinctive in the male sex by the pointed wasplike abdomen. In the female there is a marked invagination at the base of the theca where the tip of the male would fit; but this depression is also found in some of the females of species with the male abdomen rounded as usual.

This subgenus also differs in the flattened shape of the head and the relatively long antennae, which lack a lateral process on the arista. The shape of the abdominal segment 2 is also characteristic, having the proximal width much less than the distal width.

TYPE: *Conops nobilis* Williston.

Conops (Sphenoconops) brunneosericeus Kröber

Conops brunneosericeus Kröber, Stettiner Ent. Zeit., vol. 98, p. 100, 1937.

The specimens examined differ from the original description in having antennal segment 3 much shorter than antennal segment 2. Otherwise the description agrees rather well.

RANGE: Brazil.

MATERIAL EXAMINED: Brazil: Itatiaia, Rio de Janeiro, 700 m., Mar. 5, 1934, J. F. Zikan, 1 male (USNM); Palmeiras, Rio de Janeiro, Sept. 20, 1938, Jan. 7, 1939, S. Lopes, 2 females (USNM); São Paulo, Dec. 1932, J. Lane, 1 female (USNM).

Conops (Sphenoconops) velutinus Kröber

Conops velutinus Kröber, Arch. Naturg., vol. 81, Abt. A, Heft. 5, p. 146, 1915.

The type (in USNM) has been examined. This species is very closely related to *brunneosericeus*.

RANGE: Argentina (Mendoza).

Conops (Sphenoconops) nobilis Williston

Conops sericeus Walker, Insecta Saundersiana, Diptera, vol. 4, p. 256, 1852 (preoccupied).

Conops argentifacies Williston, Kansas Univ. Quart., vol. 1, p. 43, 1892 (in key).

Conops nobilis Williston, Kansas Univ. Quart., vol. 1, p. 45, 1892.

Conops palliditarsis Kröber, Konowia, vol. 6, p. 139, 1927.

The type of *sericeus*, a female, is in the British Museum. Oldroyd has supplied information indicating that it belongs here; however the name is preoccupied by *Conops sericeus* Olivier. Williston used the name *argentifacies* in his key, but described the species under *nobilis*.

RANGE: México, Costa Rica, Brazil, and Bolivia.

MATERIAL EXAMINED: Brazil: Chapada, Mato Grosso, Jan., 1 female (AMNH, cotype, labeled *argentifacies*). Bolivia: Reyes, October, W. M. Mann, 1 male (USNM). México: North Yucatán, Gaumer (Kröber det.: *magnus*?; species No. 4 of Williston in *Biologia Centrali-Americana*), 1 female (BM). Ahuacatlán, Nayarit, July 18-22, 1951, P. D. Hurd, 1 female (UCB).

Mallochoconops, new genus

Similar to *Conops* and *Physoconops*, but differing from all of the other members of the subfamily in having very wide cheeks, half the size of the eye-height. Ocellar swelling absent. Abdominal segments 2 and 3 elongated. Proboscis short, about equal to the head height.

TYPE: *Microconops atratulus* Malloch.

This genus differs from *Microconops* Kröber in having a more slender abdomen, shorter proboscis, and no ocellar swelling in addition to the wider cheeks. The ocellar swelling in *Microconops* is very distinct. The differences in the length of the abdominal segments 2 and 3 in *Microconops fasciatus* Kröber mentioned by Malloch are due to the difference in sex.

There is a superficial resemblance to the new subgenus *Gyroconops*, agreeing with it in the short proboscis, the interruption of the wing pattern (very faint in *atratulus*) in the middle of the first posterior cell, the long third antennal segment, and the dark coloration. However, besides the wider cheeks, the head is not as long, and the vertex does not extend anteriorly more than usual.

Physoconops (Pachyconops) shannoni, new species

DESCRIPTION: Male: Length 10½ mm. Front and vertex brownish yellow. A small spot above base of antennae and center of ocellar swelling black. Face and cheeks yellow, the orbital margin slightly pollinose. Antennae dark brown. Segment 2 about twice the length of segment 1. Segment 3 1½ times segment 1. Arista 3-segmented, the second segment slightly produced ventrally. Proboscis dark brown, nearly twice the length of the head. Occiput more yellowish at vertex. Posterior orbital stripe white pollinose. Thorax blackish brown. Humeri slightly reddish, the dorsum covered with fine golden pollen. A very distinct gold pollinose stripe originating medial of the humeri, extending posteriorly behind the humeri and connected with a distinct gold pollinose pleural stripe extending to the middle coxae. Pronotum and metanotum dorsally and laterally gold pollinose. Legs dark brownish, the coxae and tibiae partly yellow pollinose. Basal third of tibiae, basal tarsi, base of the claws, and pulvilli yellow. Wings with brownish dark pattern extending to the third vein, paler at the costa. Slight dark clouding along vena spuria and fifth vein. Calypters yellow; halteres yellow, brownish at the base and tip. Abdomen black, brownish on segments 2 and 3 and genitalia. Yellow at distal margin of segment 2. Golden pollinose at distal margins of all the segments and covering most of segment 6.

Female: Length 9½ mm. Similar to the male. Antennal segments 2 and 3 nearly equal. The wing more hyaline. Pollinose posterior margins of abdominal segments less distinct and absent on the terminal segments. Theca relatively small.

Variation (in paratype): Tip of abdomen missing. Similar to male, but base of antennal segment 3 reddish. Black of front more extensive.

TYPES: Holotype, male (USNM 62424); allotype, Maracaju, Mato Grosso, Brazil, May, 1937, R. C. Shannon. Paratype: Same data.

REMARKS: One more specimen referred here provisionally, from Argentina (Tucumán), differs in having the front entirely dark reddish with the black spot limited to the swelling at the origin of the antennae. The humeri are more reddish in greater contrast with the black of the thorax. Length 10 mm.

This species is related to *pictifrons*, and with it differing from all the other members of the subgenus in having the first posterior cell hyaline. In addition to having less black on the front, this species differs from *pictifrons* in the absence of any black on the oral keel.

Physoconops (Pachyconops) pictifrons (Kröber)

Conops pictifrons Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 133, 1915.

RANGE: México to Panamá.

MATERIAL EXAMINED: México: Frontera, Tabasco, Mar. 3, Townsend, 1 male (USNM). Panamá: Nata, September 1946, N. L. H. Krauss, 1 male (USNM); Barro Colorado, Dec. 1, 1930, H. F. Schwartz, 1 male (AMNH).

Physoconops (Pachyconops) gracilis (Williston)

Conops gracilis Williston, Trans. Connecticut Acad. Arts Sci., vol. 6, p. 337, 1885.

This species replaces *brachyrhynchus* in the western United States, and differs typically in being predominately reddish with pleural stripe golden, front entirely yellow, and absence of spot in facial grooves. However, most specimens show a trace of the spot in the facial grooves and in some it is very distinct. The pleural stripe may be whitish as in the specimen from México (Fresnillo), which is also rather dark in general with a prominent groove spot. However, the front is entirely yellow in that specimen.

Kröber used this name for *townsendi* (= *auratus*) and some specimens of *rufus*. His records of this species from Brazil and Chile apparently belong to *rufus*.

RANGE: United States: Colorado, New Mexico, Arizona, California. México. Colombia.

MATERIAL EXAMINED (Neotropical): México: Fresnillo, Zacatecas, 7,000 ft., Aug. 15, 1947, Michener, 1 male (AMNH). Colombia: Cauca Valley, Cali District, 3,260 ft., 1935, H. F. Schwartz, 1 male (AMNH).

Physoconops (Pachyconops) brachyrhynchus (Macquart)

Conops brachyrhynchus Macquart, Diptères exotiques, vol. 2, p. 315, 1848.

Conops xanthopareus Williston, Trans. Connecticut Acad. Arts Sci., vol. 4, p. 332, 1882.

Conops fenestratus Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 134, 1915.

This predominantly dark species is rather variable, and the two sizes of theca (very small or moderate) suggests that two species may be involved. The front is partly dark, but in some specimens the front is nearly entirely yellow, and in others an indistinct T-pattern is formed. The pleural stripe is ordinarily white, but may be yellow. The dark mark on the facial grooves may be completely absent.

In rare cases, antennal segment 3 is longer than segment 2, and quite robust, thus agreeing with the subgenus *Aconops*; but the other characters of that group are, of course, absent.

RANGE: Massachusetts to northern Florida (Gainesville), west to Wyoming and Texas.

Physoconops (Pachyconops) floridanus, new species

DESCRIPTION: Male: Length $10\frac{1}{2}$ mm. Front and vertex blackish brown, darker at ocellar swelling, in front of vertex, and above anten-

nae. Face and cheeks reddish, orbital margins yellow pollinose. Facial grooves blackish. Antennal segment 1 yellowish, reddish distally. Segment 2 blackish, about twice length of segment 1. Segment 3 reddish proximally, black distally, about equal to segment 2. Arista dark on first and second segments, distal segment (3) yellow, segment 2 only slightly produced. Proboscis yellowish, black at tip, reddish at base. Occiput blackish, yellowish below. Postorbital stripe white pollinose. Triangular mark on posterior margin of eye practically absent. Thorax black. Humeri, scutellum, and parts of the pleurae reddish. Whitish pollinose mark medial to the humeri. Whitish pleural stripe relatively indistinct. Coxae blackish, femora reddish. Tibiae yellow proximally, reddish distally. Tarsi black, yellow on segment 1, pulvilli, and claws except tips. Wings with brown pattern extending to third vein and vena spuria, more yellowish in costal and subcostal cells. First basal cell very slightly clouded, remainder of wing hyaline, except stripe anterior to the fifth vein. Calypters yellowish, halteres yellow, tips orange. Abdominal segment 1 black. Segment 2 and base of segment 3 reddish. Junction of segments 2 and 3 yellow pollinose. Narrow distal yellow pollinose margins on segments 3-5. Genitalia dark reddish.

TYPE: Holotype, male (author's collection ex. Univ. California, Davis collection), Cocoa, Fla., July 1944, G. E. Bohart.

REMARKS: This species is related to *brachyrhynchus*, but differs in having the dark front and facial grooves, and the reddish face, humeri, scutellum, legs, and abdominal segments 2, in great contrast with the very blackish thorax, distal abdomen, and tarsi. The female should have the small theca of *brachyrhynchus*.

Physoconops (Pachyconops) cubanus Parsons

Physoconops cubanus Parsons, Psyche, vol. 47, p. 35, 1940.

This species belongs to the *brachyrhynchus* group, having the small theca and the wing pattern extending into the first posterior cell. Because of the rufous on the wing pattern it superficially resembles *pictus*, but it is otherwise unrelated.

RANGE: Cuba.

MATERIAL EXAMINED: Cuba: Guabairo, Sept. 2, 1930, R. Dow, 1 female (paratype, MCZ); Soledad, Aug. 27, 1929, J. G. Meyers, 1 male (BM).

Physoconops (Pachyconops) pallifrons (Coquillett)

Conops pallifrons Coquillett, Proc. Ent. Soc. Washington, vol. 6, p. 92, 1902.

Conops palpifrons (authors, error).

This species is closely related to *brachyrhynchus* and *gracilis*, differing primarily in having a stripe of black on the cheeks.

The paratype female lacks the black on the cheeks and, in my opinion, does not belong to this species. Rather, I believe it belongs to the subgenus *Aconops*, and it is provisionally referred to *longistylus*, although it may represent a new species.

RANGE: México, Nicaragua.

MATERIAL EXAMINED: Nicaragua: Chinandega (USNM), 1 male (type). México: San Rafael, Vera Cruz, July 3, Townsend, 1 male (paratype, USNM); Cuernavaca, Sept. 4, 1922, E. G. Smyth, 1 (abdomen off) (USNM).

Physoconops (Pachyconops) gracilianus, new species

DESCRIPTION: Male: Length 15 mm. Front dark yellowish with an indistinct narrow blackish brown stripe in front of the vertex connected with a narrow line that extends downward past the base of the antennae. Vertex dark yellow, the ocellar swelling black. Face and cheeks entirely yellow, the facial grooves and anterior orbitals whitish pollinose. Antennal segment 1 light brownish, segments 2 and 3 black, reddish below and on arista. Segment 2 about twice length of segment 1, segment 3 equal to segment 2. Proboscis black, brownish in the middle, $1\frac{1}{2}$ times head height. Occiput blackish above, yellowish below. Posterior orbitals white pollinose. Thorax black, the humeri and scutellum reddish. Pale yellow pollinose medial to the humeri, on the scutellum, and a vertical stripe on the pleurae. Anterior and middle coxae dark reddish covered with whitish pollen. Femora reddish, posterior one darkened. Tibiae yellowish at base, dark reddish distally. Tarsi blackish, the first reddish. Pulvilli and claws, except the black tip, yellow. Wings with dark pattern extending to the third vein and the vena spuria, paler in the costal and subcostal cells and apex of the wing. Remainder of the wing hyaline except along fifth vein. Calypters and halteres yellow. Segments 1 and 2 of the abdomen black, the remainder dark reddish. Junction of segments 2 and 3 with a moderately wide yellow pollinose band. Narrower distal margins of segments 3 and 4 gold pollinose. Segments 5 and 6 nearly covered with golden pollen. Genitalia dark reddish.

Female: Length 12 mm. Similar to the male. The theca moderate in length and rather robust, yellow anteriorly.

Variation (in paratype): Length 14 mm., otherwise similar to the male.

TYPES: Holotype, male (USNM 62425). Allotype, Cuernavaca, Morelos, México, September 1923, E. G. Smyth. Paratype: 1 male, same data (author's collection).

REMARKS: This species is related to *brachyrhynchus* and *gracilis*, but the distal abdomen is reddish with segments 1 and 2 black. In *gracilis* if there is black on the abdomen it is on the distal segments;

and in *brachyrhynchus* if abdominal segment 2 is black the remainder of the abdomen is black. In addition, the theca is larger and more robust than in *gracilis* and *brachyrhynchus*, but not as long as in *excisus* or *bulbirostris*.

Phyoconops (Pachyconops) pictus (Fabricius)

Conops pictus Fabricius, Entomologia systematica, vol. 4, p. 39, 1794.

This distinctive species has a very large theca that is reddish with golden pollen. There is sometimes slight darkening on the medial side of antennal segment 3. The color of the basal cells is as dark as the remainder of the wing pattern. The dorsum of the thorax has the yellow extending back partly dividing the black into three stripes, and forming one large or two smaller yellow spots.

RANGE: Cuba, Haiti, Puerto Rico.

MATERIAL EXAMINED: Cuba: Havana, T. Barbour, 2 females (MCZ, USNM); Vinales, Pinar del Río, Aug. 27-31, 1951, P. Vaurie, 1 male (AMNH). Haiti: Manneville, Sept. 16-17, 1934, Darlington, 1 male (USNM). Puerto Rico: Isabela, June 26, 1948, Oakley and Mills, 1 male (USNM); Bayanon, Dec. 25, 1934, Anderson and Lesesne, 1 female (author's collection).

Phyoconops (Pachyconops) ramondi (Bigot)

Conops ramondi Bigot, Diptera, in de la Sagra, Historia . . . natural de la Isla de Cuba, pt. 2, vol. 7, p. 808, 1857.

This species differs immediately from *pictus* by the very large size. The thorax is rufous with small dark markings. The third antennal segment is dark reddish with some black laterally and mostly blackish medially. The abdomen is dark reddish with very little golden pollen. The theca is large as in *pictus*, and the basal cells are as dark as the rest of the wing pattern. The postoccipital stripe is absent in this species as well as in *pictus*.

RANGE: Cuba.

MATERIAL EXAMINED: Cuba: Guantánamo, June 21, 1910, 1 female (MCZ).

Phyoconops (Pachyconops) bahamensis Parsons

Phyoconops bahamensis Parsons, Psyche, vol. 47, p. 29, 1940.

This species has not been examined but presumably belongs to this subgenus. It is known only from the type female. It appears to be related to *guianicus*, and has the same large theca. In the original description the second abdominal segment was omitted. Darlington informs me that it is reddish brown.

RANGE: Bahama Islands.

Physoconops (Pachyconops) gracilior (Kröber)

Conops gracilior Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 150, 1915.

RANGE: Brazil (Santa Catarina), Paraguay.

MATERIAL EXAMINED: Paraguay: Kröber collection, 1 male, 1 female (cotypes, USNM).

Physoconops (Pachyconops) crudus (Walker)

Conops cruda Walker, List of the specimens of dipterous insects in the collection of the British Museum, vol. 3, p. 671, 1849.

This species has not been identified since originally described. Judging from Kröber's redescription it belongs to this subgenus and is related to *guianicus*. The origin of the type is not known, but Kröber felt that it is a Neotropical species.

Physoconops (Pachyconops) guianicus (Curran)

Conops guianica Curran, Bull. Amer. Mus. Nat. Hist., vol. 66, p. 417, 1934.

RANGE: British Guiana, Venezuela, Colombia, Brazil, Perú.

MATERIAL EXAMINED: British Guiana: Kartabo, June 30, 1924, 1 female (type, AMNH). Venezuela: Las Adjuntas, 959 m., July 4, 1926, H. E. Box, 1 female (USNM). Colombia: Don Diego, Magdalena, 100 ft., May, H. H. Smith, 1 female (author's collection, ex Carnegie Mus.). Brazil: Campinas, Goyaz; collectors, Borgmeier, Lopes, and Spitz, 2 males, 1 female (USNM); Maracaju, Mato Grosso, May, 1937, R. C. Shannon, 2 males, 1 female (USNM). Perú: Pucallpa, May 21, 1951, J. M. Schunke, 1 female (author's collection).

Physoconops (Pachyconops) grandis (Williston)

Conops grandis Williston, Kansas Univ. Quart., vol. 1, p. 44, 1892.

RANGE: Brazil (Mato Grosso).

MATERIAL EXAMINED: Brazil: Chapada, 1 male (cotype, Williston collection, AMNH); 1 female (probably a cotype, Williston collection, AMNH); Chapada, 1 male (probably a cotype, in USNM but with AMNH label).

Physoconops (Pachyconops) rufus (Williston)

Conops rufus Williston, Kansas Univ. Quart., vol. 1, p. 44, 1892.

This species resembles *townsendi* (= *auratus*), but the pollen behind the vertex is relatively indistinct. Kröber's records of *gracilis*, from Chile in 1915, apparently belong to this species. He also correctly identified this species from Brazil at that time, but in his last work (1939) he incorrectly used this name for a species of *Physocephala*.

RANGE: Brazil, Chile.

MATERIAL EXAMINED: Brazil: Chapada, January, 1 male, 1 female (cotypes, AMNH); Maracaju, May 1937, R. C. Shannon, 2 females

(USNM); Mogy Mivim, São Paulo, November 1939, Pereira, 1 female (USNM).

Physoconops (Pachyconops) bulbirostris (Loew)

Conops bulbirostris Loew, Neue Beiträge zur Kenntniss der Dipteren, No. 1, p. 30, 1853.

Conops sequax Williston, in Godman and Salvin, Biologia Centrali-Americana, Diptera, vol. 3, pt. 1, p. 80, 1892.

This species has been recorded from South America, but I have not seen any from south of México. The variation includes the characters of *sequax*.

RANGE: New Jersey to Florida west to Indiana and Texas. México (Jalisco, Vera Cruz, Yucatán). Brazil? Bolivia? Paraguay?

Physoconops (Pachyconops) travassosi, new species

DESCRIPTION: Male: Length 14 mm. Vertex and front blackish, slightly reddish in front of ocellar swelling. Face yellowish, cheeks and parts of lower face blackish. Facial grooves and orbital margins yellow pollinose. Antennae blackish, reddish at base of antennal segment 3 and distal arisal segment. Segment 2 twice the length of segment 1. Segment 3 about equal to segment 2. Arisal segment 2 only slightly produced. Proboscis black, nearly twice height of head. Occiput black, yellowish below. Postorbital stripe grayish pollinose with indistinct postvertical pollinose stripe. Thorax black, faintly yellow pollinose especially on coxae and metanotum. Legs black, faintly yellow pollinose, tibiae yellowish proximally and distally. Tarsi and base of claws dark yellowish. Pulvilli bright yellow. Wings with dark brownish pattern, extending to the fifth vein proximally and vena spuria distally, completely filling first basal cell. Remainder of wing hyaline except stripe along fifth vein. Calypters dark yellow with blackish margin. Halteres yellow, brownish at tip. Abdomen black, narrow yellow pollinose at distal margins of segments 1 and 2. Apex of abdomen grayish pollinose. Segment 6 more elongated than usual. Genitalia dark reddish.

Female: Length 13½ mm. Similar to the male. Face darker, more reddish. The theca very long, yellowish anteriorly distally.

Variation (in paratypes): Length 12 to 14½ mm. Front more blackish in one female. Face darker, more reddish in one male; bright yellowish in one female.

TYPES: Holotype, male (USNM 62426), Maracaju, Mato Grosso, Brazil, May 1937, R. C. Shannon. Allotype (USNM), E. Lefevre, São Paulo, Brazil, Sept. 1, 1937, Travassos, Lopes, and Oiticica. Paratypes: Brazil: 1 male, same data as holotype; 1 female (USNM), Palmiras, Rio de Janeiro, 1940, Lopes; 1 female (USNM), Salobra,

Mato Grosso, July 1939; 1 female (USNM), Campinas, Goyaz, January 1936, R. Spitz.

REMARKS: This species has a relatively elongated abdominal tip in the male, thus showing a tendency toward the subgenus *Shannonconops*. Otherwise it is very similar to *Physoconops magnus*, which also has the elongated sixth abdominal segment. However, it is smaller than *magnus*; and differs from it, in the female, by having the long theca and abdominal segments 2 and 3 nearly as wide as long. In the female of *magnus*, the theca is relatively short and the abdominal segments 2 and 3 are elongated, segment 2 being about twice as long as wide. *Magnus* also has three propleural bristles to the usually one or sometimes two in *travassosi*.

This name was selected by Shannon to honor the Brazilian entomologist Lauro P. Travassos.

Physoconops (Pachyconops) costaricensis (Kröber)

Conops costaricensis Kröber, Konowia, vol. 6, p. 135, 1927.

RANGE: Costa Rica, Panamá.

MATERIAL EXAMINED: Costa Rica: San José, La Caja farm, 1 male (author's collection, ex Steyskal collection), June 1928, Schmidt. Panamá: Barro Colorado, Canal Zone, 1 female (AMNH), Dec. 1 1930, H. F. Schwartz.

Physoconops (Pachyconops) magnus (Williston)

Conops magnus Williston, Kansas Univ. Quart., vol. 1, p. 43, 1892.

This species is very similar to *travassosi* in the male, but the female is very different, having a relatively short theca. The abdomen of the female also has segments 2 and 3 elongated, so that segment 2 is about twice as long as wide. The specimens seen have three propleural bristles.

RANGE: Brazil (Mato Grosso).

MATERIAL EXAMINED: Brazil: Chapada, 1 male, 1 female (cotypes, AMNH)

Physoconops (Pachyconops) connectens, new species

DESCRIPTION: Male: Length 12 mm. Front yellowish, darker in center. Vertex dark yellowish. Ocellar swelling black. Face yellow, cheeks black. Orbital margins yellow pollinose. Antennae dark yellowish, blackish dorsally. Segment 2 nearly twice length of segment 1. Segment 3 equal to segment 2. Second arisal segment slightly produced medially. Proboscis reddish, black at base and tip, about 1½ times head height. Occiput blackish, postorbitals yellow pollinose, with distinct postvertical connecting stripe. Thorax black. Gold pollinose line medial to the humeri extending into a

distinct gold pollinose pleural stripe. Postnotum gold pollinose dorsally and laterally. Coxae gold pollinose on black. Femora reddish, posterior blackish. Tibiae yellowish proximally, dark reddish distally. Tarsi blackish, yellowish on segment 1. Pulvilli and claws except tips yellow. Wings with brown pattern extending to fifth vein and vena spuria, the costal cells and first basal cells more yellowish. Remainder of wings hyaline except along fifth and sixth veins. Calypters and halteres yellow. Abdomen black with a wide distal gold pollinose margin on segments 1-4. Segments 5 and 6 nearly entirely gold pollinose. Genitalia dark reddish.

Female: Length 13 mm. Similar to the male. Antennal segment 2 twice length of segment 1 and slightly longer than segment 3. Posterior femur as reddish as the others. Basal cells of wing nearly hyaline. Theca long and robust, entirely black except slight yellowish tip.

Variation (in paratypes): Length 13 to 14½ mm. Legs paler in one. In the other specimen, posterior femur as reddish as the other femora, abdominal segment 2 yellowish laterally, genitalia nearly entirely black.

Types: Holotype, male (F. Johnson collection, AMNH), Rabinal, Guatemala, 3,000 ft., July 2, 1947, C. and P. Vaurie. Allotype (author's collection), Tehuacán, Puebla, México, June 23, 1951, P. D. Hurd. Paratypes: México: 1 male (USNM), Isthmus of Tehuantepec, Sumichrast, 1 male (UCB), Lagunilla, Hidalgo, June 14, 1951, P. D. Hurd.

Remarks: This species combines characteristics of both *excisus* and *townsendi* (= *auratus*). Populations located between the ranges of *excisus* and *townsendi* (= *auratus*) may also resemble this species. Kröber (Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 139, 1915) identified this species and intermediates between *excisus* and *townsendi* (= *auratus*) as *auratus*. At this time it might be well to comment on some other identifications by Kröber in that paper. His *gracilis* (p. 139) consists of *rufus* and *townsendi* (= *auratus*). His *xanthopareus* is *gracilis* (p. 135), and he renamed *xanthopareus* (= *brachyrhynchus*) as *fenestratus* (p. 134).

The records of *gracilis* from Chile, therefore, belong to *rufus*. His record of *excisus* from México probably belongs to *connectens*. Some of the specimens from Texas and Kansas that he lists as *excisus* and *auratus* probably represent intermediates between *excisus* and *townsendi* (= *auratus*).

Physoconops (Pachyconops) townsendi, new name

Conops auratus Townsend, Trans. Amer. Ent. Soc., vol. 27, p. 161, 1901. (Preoccupied by *Conops aurata* Walker, 1871.)

C. auratus was used by Kröber for *connectens*, and *gracilis* was used for this species. Recognition of *connectens*, and the distinction of *townsendi* (= *auratus*) from *rufus* should clear up the confusion of names.

RANGE: Texas, New Mexico, Arizona, California.

Physoconops (Pachyconops) excisus (Wiedemann)

Conops excisus Wiedemann, Aussereuropäische zweiflügelige Insecten, vol. 2, p. 234, 1830.

Conops sugens Weidemann, Aussereuropäische zweiflügelige Insecten, vol. 2, p. 236, 1830.

This species belongs to a well defined group characterized by a very distinct uninterrupted postvertical pollinose stripe connecting the postorbitals. The group includes *townsendi*, *connectens*, and *parsonsi*, all of which replace each other in range. Some of the other species of the subgenus, especially *bulbirostris* and *costaricensis*, may have a very distinct postvertical stripe, but it is usually interrupted in the center.

RANGE: New York to Florida, west to Colorado and Oklahoma.

Physoconops (Pachyconops) parsonsi, new species

DESCRIPTION: Female: Length 13 mm. Front blackish, slightly reddish near antennae. Vertex reddish, yellow anterolaterally. Ocellar swelling black. Face reddish yellow, facial grooves more yellowish. Cheeks black. Orbital margins gold pollinose. Antennae black, reddish at base of segment 3, segment 1 yellow. Segment 2 twice length of segment 1. Segment 3 about equal to segment 2. Second arisal segment slightly produced medially. Proboscis reddish yellow, black proximally and at tip, $1\frac{1}{4}$ times head height. Occiput black. Postorbitals gold pollinose with very distinct postvertical connecting stripe. Thorax black, humeri and area medially gold pollinose, connected with very distinct gold pollinose pleural stripe. Spots at base of wings and most of metanotum, gold pollinose. Coxae black, gold pollinose anteriorly. Femora and tibiae reddish yellow. Tarsi blackish, claws (except tips) and pulvilli reddish yellow. Pattern of wing rufous becoming blackish distally, extending between first and third vein and vena spuria. Remainder of wings nearly hyaline, except along fifth vein. Calypters yellow, halteres brownish yellow. Abdominal segments 1 and 2 black with distal gold pollinose margin. Remainder of abdomen dark reddish, with dark distal margins. Theca large and reddish.

Male: Length $14\frac{1}{2}$ mm. Similar to the female, but having the front mostly dark yellow, with a small incomplete black medial stripe above the base of antennae. The costal cells and first basal cells of the wings are yellow. Abdominal segments 5 and 6 are reddish black, the genitalia reddish. Abdominal segment 6 faintly yellow pollinose.

TYPES: Holotype, female (USNM 62427), Buenos Aires, Trinidad Mountains, Cuba, C. T. Parsons, June 17-23, 1939. Allotype, (USNM), Havana, Cuba, Baker.

REMARKS: This species was recognized as new by Parsons, but he was not certain that it might not be a variation of *pictus*. The grouping of the species in this genus reveals, however, that this species could not possibly be a variation of *pictus* because of the distinct pollinose postvertical stripe.

This species differs from *cubanus* by the larger theca of the female, although it is not as large as in *pictus*. The male is very similar to the male of *cubanus*; but, since *cubanus* belongs to the *brachyrhynchus* group, it lacks the distinct pollinose postvertical stripe, the facial grooves are darkened near the oral margins, and the cheeks are entirely yellowish. In addition, the humeri are yellow. The male of *parsonsi*, on the other hand, belonging to the *excisus* group, has the distinct postvertical stripe, black on the cheeks, and no trace of darkening in the facial grooves at the oral margins. The humeri, while covered with yellow pollen, are black underneath.

Physoconops (Pachyconops) pullipes (Eymelt)

Aconops pallipes Eymelt, Senckenbergiana, vol. 25, p. 53, 1942.

This species has not been seen, but it appears to belong to this subgenus. Although described under *Aconops*, the illustration of the antennae as well as the description clearly indicate that it does not belong to the subgenus *Aconops* as defined here.

RANGE: Brazil (Espírito Santo).

Shannonconops, new subgenus

Similar to the subgenus *Pachyconops* in all respects except for the shape of the terminal segments of the abdomen in both sexes.

The male has abdominal segment 6 elongated so that it is longer than wide, and terminates in a relatively sharp point. Superficially, the abdomen resembles that of the subgenus *Sphenoconops* of the genus *Conops*.

Contrary to the female of *Sphenoconops* which is relatively normal in appearance, the female of this subgenus is very peculiar. Abdominal segment 6 is narrower at the base than at the apex, and the resulting segment 7 is elongated. The posterior outline of segment 7 is semi-S-shaped, being concave above and convex below.

TYPE: *Physoconops apicalis*, new species.

Physoconops (Shannonconops) apicalis, new species

DESCRIPTION: Male: Length 14½ mm. Front and vertex black, slightly yellowish in front of ocellar swelling. Face and cheeks,

including facial grooves, blackish. Facial ridges yellowish brown at base of antennae. Orbital margins yellow pollinose. Antennae black. Segment 3 dark reddish. Segment 2 nearly twice length of segment 1. Segment 3 nearly equal length of segment 2. Proboscis blackish, yellow in the middle, about $1\frac{1}{4}$ head height. Thorax black, faint yellowish pollinose. Coxae and legs black, yellowish pollinose, tarsi more yellowish. Pulvilli and base of claws yellow. Wings with dark brown pattern extending to the fifth vein and vena spuria, paler apically. Remainder of wing hyaline except stripe along fifth vein. Calypters yellow, halteres yellow with brown tips. Abdomen black with narrow yellow pollinose margin between segments 2 and 3. Distal abdomen faint gray pollinose. Segment 6 produced distally to a point, longer than wide. Genitalia dark yellowish.

Female: Length 15 mm. Similar to the male. Antennae more blackish. Segment 3 equal to segment 2. Face with more yellowish dorsally. Facial grooves more yellowish ventrally. Wings darker, the hyaline areas brownish. Genital segments very distinctive. The theca is very large and thick at the base. Abdominal segment 6 is narrower at the base than at the apex. Transverse segment 7 is concave above posteriorly.

TYPES: Holotype, male (USNM 62428), Maracaju, Mato Grosso, Brazil, May 1937, R. C. Shannon. Allotype (AMNH), Achinaniza, Perú, Oct. 8, 1927, H. Bassler.

Subgenus *Aconops* Kröber

Aconops Kröber, Arch. Naturg., vol. 83, Abt. A, Heft 7, p. 142, (1917) 1919.

Wing pattern extending into first posterior cell only narrowly along the third vein. Pollinose mark medial to the humeri extending into the distinct pleural stripe. Antennal segment 3 relatively robust; usually much thicker and as long or longer than segment 2.

While none of the above characters are peculiar to this group, the combination will easily distinguish its members. Originally this name was used to separate the species with an elongated antennal segment 3, but the present study shows that this results in an unnatural grouping.

TYPE: *Conops antennatus* Kröber.

Physoconops (Aconops) longistylus (Kröber)

Conops longistylus Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 149, 1915.

This species is characterized by the partly blackish front and yellow checks. By analogy with related forms the long third antennal segment is considered variable. The female cotype of *pallifrons* is referred here as a well marked variety, but may be a new species.

RANGE: México (Guerrero), Nicaragua, Costa Rica, Brazil (Santa Catarina).

MATERIAL EXAMINED: México: Chilpancingo, Guerrero, 4,600 ft., June, H. H. Smith, 1 (male, wrong abdomen, BM). Nicaragua: San Marcos, Baker, 1 female (USNM, cotype of *pallifrons*).

Physoconops (Aconops) costatus (Fabricius)

Conops costatus Fabricius, *Systema antliatorum*, p. 175, 1805.

Information on the type kindly supplied by S. L. Tuxen enables the identification of this species for the first time since originally described.

RANGE: Colombia, Brazil (Bahia).

MATERIAL EXAMINED: Brazil: Bahia, June 10, 1929, R. C. Shannon, 1 male (USNM). Colombia: Río Frío, Magdalena, Aug. 21, 1927, G. Salt, 1 male (AMNH).

Physoconops (Aconops) antennatus (Kröber)

Conops antennatus Kröber, *Arch. Naturg.*, vol. 81, Abt. A, Heft 5, p. 150, 1915.
Aconops syrphoides Blanchard, *Anal. Soc. Cient. Argentina*, vol. 126, p. 351, 1938.

The front of this species is rather variable, the dark pattern being reddish, black, or both. Unlike *longistylus* and *costatus*, the cheeks are black.

RANGE: Brazil (Bahia), Argentina (Mendoza).

MATERIAL EXAMINED: Argentina: Mendoza, 1 male, 1 female (USNM). Brazil: Bahia, May, R. C. Shannon, 1 male (USNM).

Gyroconops, new subgenus

This subgenus is immediately recognized by the large vertical swelling extending halfway from the occiput to the base of the antennae. It is covered with many short hairs, as is the dorsum of the thorax. The length of the head is greater in proportion to the height, and the base of the abdomen is wider than in other *Physoconops*. The propleural ridge frequently has more than one bristle.

TYPE: *Physoconops sylvovus* (Williston).

REMARKS: This group was recognized as distinct by Shannon, and the name used is taken from his manuscript labels.

Physoconops (Gyroconops) abbreviatus, new species

DESCRIPTION: Male: Length 6 mm. Front black. Face and cheeks yellow. Oral keel black. Orbitals white pollinose. Antennae black, yellowish proximally on segment 3 and distally on segment 2. Segment 2 twice length of segment 1. Segment 3 slightly longer than segment 2. Proboscis black, yellowish distally, 1½ times head height. Thorax black, faint white pollinose with indistinct pleural stripe.

Coxae black, white pollinose. Legs brownish. Apex of femora, base of tibiae, claws (except tips), and pulvilli yellow. Wings with dark pattern from costa to third vein terminating abruptly at the end of the second vein. First posterior cell entirely hyaline. Apex of submarginal cell slightly darkened. Remainder of wing hyaline. Calypters and halters yellow. Abdomen black. Yellow band at junction of segments 2 and 3. Tip of abdomen with very short whitish hairs giving a pollinose appearance. Genitalia black.

TYPES: Holotype, male (BM), Xucumanatlan, Guerrero, México, 7,000 ft., July, H. H. Smith.

REMARKS: This specimen was listed by Kröber (Ann. Mag. Nat. Hist., ser. 11, vol. 4, p. 467) as *abruptus?*

This species is very similar to *ocellatus* and *sylvosus*, but it is immediately distinguishable by having the first posterior cell hyaline.

Physoconops (Gyroconops) sylvosus (Williston)

Conops sylvosus Williston, Trans. Connecticut Acad. Arts Sci., vol. 4, p. 329, 1883.
Conops arizonicus Banks, Ann. Ent. Soc. Amer., vol. 9, p. 191, 1916.

The face is black on one specimen (USNM) from Florida (no locality), but I believe it is a melanism.

RANGE: United States: Massachusetts to Florida, west to Nebraska and California. México: Baja California, Guerrero, Puebla.

Physoconops (Gyroconops) ocellatus (Giglio-Tos)

Conops ocellatus Giglio-Tos, Boll. Mus. Zool. Univ. Torino, vol. 7, No. 132, 1892.
Conops parvus Williston, Kansas Univ. Quart., vol. 1, p. 46, 1892.

RANGE: México, Brazil.

MATERIAL EXAMINED: Brazil: Chapada, 1 male (AMNH, cotype); Nova Teutonia, Feb. 4, 1939, F. Plaumann, 1 male (BM). México: "Hd. R. Piedras Verdes," Sierra Madre, Chihuahua, Aug. 16, Townsend, 1 female (USNM).

Kroeberconops, new subgenus

Similar to the subgenus *Pachyconops* but having the vertex triangular in shape rather than rounded anteriorly and having antennal segment 3 about half the length of segment 2 rather than about equal to the length of segment 2. There is also a slight indentation at the junction of the face and front on the orbital margin which is not seen in any of the other members of the genus.

TYPE: *Physoconops hermanni* (Kröber).

Physoconops (Kroeberconops) rufipennis (Macquart)

Conops rufipennis Macquart, Diptères exotiques, vol. 3, suppl. 3, p. 10, 1843.

This species is located here on the basis of the one specimen seen, which had been so determined by Kröber. The other records of this

species based on sporadically determined specimens must be verified. The type is in the Paris museum (MHNP) and Séguy informs me that it is from Brazil.

RANGE: Brazil, Argentina, Uruguay, Costa Rica? Puerto Rico?

MATERIAL EXAMINED: Argentina, 1904, O. W. Thomas, 1 male (BM).

Physoconops (Kroeberoconops) hermanni (Kröber)

Conops hermanni Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 145, 1915.

Physoconops perbellum Kröber, Ann. Mag. Nat. Hist., ser. 11, vol. 4, p. 467, 1939.

RANGE: Argentina (Mendoza).

MATERIAL EXAMINED: Argentina: Mendoza, 1 male, 1 female (cotypes, USNM).

Subgenus *Physoconops* Szilady

This subgenus is characterized by the narrow front, short antennal segment 3, and relatively prominent triangular mark on the posterior margin of the eye. It is more specialized from the primitive *Pachyconops* than any of the other subgenera, yet shows more intergradation and is less distinctive superficially.

TYPE: *Physoconops obscuripennis* (Williston) (= *brachyrhynchus* of Szilady, nec Macquart).

Physoconops (Physoconops) abruptus (Kröber)

Conops abruptus Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 144, 1915.

RANGE: Brazil (Santa Catarina, Mato Grosso), Paraguay, Argentina.

MATERIAL EXAMINED: Argentina: Mendoza, 1 male, 1 female (cotypes, USNM). Paraguay: Villarica, Jan. 1939, F. Shade, 1 female (author's collection, ex Sabrosky collection). Brazil: Maracaju, May 1937, Shannon, 2 females (USNM); Nova Teutonia, 300-500 m., Jan. 25, 1952, F. Plaumann, 1 male, 1 female (author's collection).

Physoconops (Physoconops) gilmorei, new species

DESCRIPTION: Male: Length 10½ mm. Front and ocellar swelling opaque black. Vertex dark brownish. Face opaque black extending into a line on the cheeks. Cheeks and facial grooves and anterior orbitals yellow pollinose. Antennae black, segment 3 reddish, segment 2 about 2½ times segment 1, segment 3 somewhat longer than segment 1. Arista apparently 2-segmented. Occiput black, yellowish below, postorbitals yellow pollinose. Large triangular space at posterior margin of the eye. Proboscis dark brown, about 1¾ times

head height. Thorax black, very faint whitish pollinose; with golden pollinose spot medial to the humeri. Legs black, coxae yellow pollinose. Tibiae yellow at base. Claws (except tip) and pulvilli yellow. Wings with dark pattern extending to the third vein more yellowish anterior to second vein. The black between the second and third veins is interrupted beyond the end of the second vein, but extends faintly along the third vein to the tip of the cell posteriorly. Remainder of wing hyaline except mark at base of vena spuria and along fifth vein. Calypters and halteres yellow. Abdomen black, yellowish at base of segment 3. Wide gold pollinose distal margins on segments 1-5. Remainder of abdomen entirely gold pollinose. Genitalia reddish black.

Variation (in paratypes): Length $9\frac{1}{2}$ to $12\frac{1}{2}$ mm. One similar to the type with black on face becoming reddish ventrally. One similar to the type but pattern in submarginal cell completely hyaline distal to interruption of the dark pattern. One similar to the type but most of front dark yellowish and no black on the face (teneral?). One similar to the type but face dark reddish instead of black. Interruption of wing pattern in submarginal cell complete. The wing pattern anterior to second vein nearly hyaline. Two similar to the type but black of face replaced by reddish yellow.

Types: Holotype, male (USNM 62429), Maracaju, Mato Grosso, Brazil, May 1937, R. C. Shannon. Paratypes: Brazil: 3 males (USNM), same data as holotype; 1 male (USNM) Goyaz, Nov. 1932, Spitz; Paraguay: 2 males (author's collection ex Sabrosky collection), Villarica, January 1939, F. Schade.

REMARKS.—This species is related to *abruptus* but differs in having the front entirely black, the black extending in some specimens onto the face. In the "teneral" specimen, the black of the front is confined to the transverse line in front of the vertex. No female has been seen, but it should resemble the female of *abruptus* except for the color of the front and face.

This name was used by Shannon for his good friend and colleague, Raymond W. Gilmore, a mammalogist who was with him in Brazil.

Physoconops (Physoconops) fronto (Williston)

Conops fronto Williston, Trans. Connecticut Acad. Arts Sci., vol. 6, p. 378, 1885.

Conops pulchellus Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 7, p. 134, 1915.

Conops argentifacies Van Duzee, Proc. California Acad. Sci., vol. 16, p. 574, 1927.

Conops fraterculus Van Duzee, Proc. California Acad. Sci., vol. 16, p. 575, 1927.

Conops rubicundulus Van Duzee, Proc. California Acad. Sci., vol. 16, p. 576, 1927.

This species shows considerable variation geographically but is usually easily distinguished. Western specimens have the front averaging narrower, and usually entirely bright yellow. Eastern

specimens frequently have an indistinct dark midline on the front; and the hyaline areas of the wing may be so brownish as to resemble *obscuripennis* superficially. One specimen from México has an indistinct T-pattern on the front.

RANGE: United States: Massachusetts to Florida, west to Washington and California. México: Chihuahua, Zacatecas, Jalisco.

Phyoconops (Phyoconops) nigrimanus (Bigot)

Conops nigrimanus Bigot, Ann. Soc. Ent. France, ser. 6, vol. 7, p. 38, 1887.

Conops striatifrons Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 132, 1915.

Conops limuva Brimley, Ent. News, vol. 38, p. 235, 1927.

This distinctive species is related to *fronto*. I have not seen any specimens from west of the Atlantic Coast States.

RANGE: New Jersey to Florida (Gainesville), west to Nebraska and Texas.

Phyoconops (Phyoconops) peruvianus, new species

DESCRIPTION: Female: Length 9 mm. Vertex reddish. Ocellar swelling black, front yellow with distinct black T-pattern. Face and cheeks yellow. Orbitals and facial grooves yellow pollinose. Occiput blackish above, yellow below. Postorbitals yellow pollinose. Antennae black. Segment 2 is $2\frac{1}{2}$ times segment 1. Segment 3 somewhat longer than segment 1. Proboscis black, yellow in the center, $1\frac{1}{2}$ times head height. Thorax black, faint gold pollinose spot medial to the humeri. Legs black, golden pollinose at the coxae, yellowish at base of tibiae. Claws (except tips) and pulvilli yellow. Wing with pattern extending to third vein, yellowish in costal, subcostal, and distal marginal cells. Remainder of wing hyaline except stripe along fifth and sixth veins. Calypters yellow, halteres yellow with tips reddish brown. Abdomen black, golden pollinose distal margins on segments 1 and 5. Yellow band at base of segment 3, remainder of abdomen yellow pollinose. Theca black, moderately long but thin.

TYPE: Holotype, female (author's collection), Pucallpa, Perú, Feb. 1, 1951, J. M. Schunke.

REMARKS: This species is similar to *angustifrons*, but has the black T-front of *abruptus*. It is therefore close to *nigrimanus*, differing mainly in having black instead of reddish legs, but there is a wide interruption in range.

Phyoconops (Phyoconops) angustifrons (Williston)

Conops angustifrons Williston, Kansas Univ. Quart., vol. 1, No. 1, p. 44, 1892.

Phyoconops pulvillatus Eymelt, Senckenbergiana, vol. 25, p. 54, 1942.

Eymelt correctly recognized that Kröber had described two species under this name, but described the wrong one. A cotype in the American Museum of Natural History collection has been examined.

RANGE: Texas (Brownsville), México (Vera Cruz), Trinidad, Brazil, Paraguay.

Phyoconops (Phyoconops) inornatus (Williston)

Conops inornatus Williston, Kansas Univ. Quart., vol. 1, No. 1, p. 45, 1892.

The two cotypes of *inornatus* have been examined and the name is hereby restricted to the male, which was described first. The female belongs to the new species *infuscatus*.

RANGE: Brazil.

MATERIAL EXAMINED: Brazil: Chapada, 1 male (cotype, AMNH); Annapolis, Goyaz, Nov. 20, 1936, 1 female (USNM); Maracaju, May 1937, Shannon, 3 males (USNM).

Phyoconops (Phyoconops) infuscatus, new species

DESCRIPTION: Male: Length 9½ mm. Front opaque black. Vertex blackish red. Face and cheeks blackish, reddish toward base of antennae. Facial grooves and orbital margins yellow pollinose. Antennae yellowish brown, darker dorsally. Segment 2 nearly three times length of segment 1. Segment 3 equal to segment 1. Proboscis black, 1¼ times head height. Occiput blackish above, narrowly yellowish below. Postorbitals yellow pollinose. Thorax black, faintly yellowish pollinose, more marked medial to the humeri, on the scutellum and metanotum, and above the coxae. Legs brownish black. Yellowish at base and tips of femora, tarsi (except sides), claws (except tips), and pulvilli. Wing with dark brown pattern extending from costa to fifth vein, paler at apex of wing and in distal submarginal cell along the third vein. Remainder of wing hyaline except streak along vena spuria, fifth and sixth veins, and base of anal cell. Calypters dark yellow. Halteres dark yellow, brownish at tips. Abdomen black, segment 2 dark reddish, narrow yellowish border between segments 2 and 3. Distal gray pollinose margins on abdominal segments very faint. Segment 6 gray pollinose. Genitalia reddish black.

Female: Length 10½ mm. Similar to the holotype male, but face yellowish. Second antennal segment 2½ times the first. The black confined to the cheeks. Theca long reddish black.

Variation (in paratypes): Length 8 to 10½ mm. One male, similar to the holotype male, but face yellowish with narrow margin of black extending ventrally from the front and dorsally from the cheeks, but not quite meeting. Second antennal segment 2½ times the first.

One male, similar to the holotype, but face partly yellowish. The dark areas darker. Abdominal segment 2 nearly black. Second antennal segment $2\frac{1}{2}$ times the first. One specimen (abdomen missing), similar to the holotype, but face partly dark reddish. Second antennal segment $2\frac{1}{2}$ times the first. One male, similar to the holotype, but with black areas darker and abdominal segment 2 more brownish. Face partly yellowish, along the grooves. Facial grooves and anterior orbits quite dark beneath the pollen. Second antennal segment $2\frac{1}{2}$ times the first. One male, similar to the holotype, but front and vertex reddish (teneral?). Face reddish. Facial grooves blackish, below the yellow pollen. Black areas darker, especially tarsi; black of wings paler. One male, similar to the holotype, but black areas much darker, more extensive. Face very black in appearance due to dark under pollen of orbits and facial grooves. Abdominal segment 2 black.

TYPES: Holotype, male (USNM 62430). Allotype, Maracaju, Mato Grosso, Brazil, May 1937, R. C. Shannon. Paratypes: Brazil: 2 males, 1 female, 1 (abdomen off), same data; 1 male (USNM), Rio Claro, São Paulo, July 1939, Claretiano; 1 male (author's collection), Nova Teutonia, Oct. 21, 1951, F. Plaumann; 1 male (author's collection), Nova Teutonia, Dec. 9, 1951, F. Plaumann.

REMARKS: One specimen (USNM) from Brazil (Maracaju, May 1937, R. C. Shannon), is referred here but may represent a new species. It is much larger in size (14 mm.), the face is dark yellowish, more distinct from the black of the front, and the cheeks have the dark area narrower. Antennal segment 3 is reddish brown in more contrast with the dark segment 2. The black pattern of the wing fills the submarginal cell completely and extends partly into the first posterior cell in the proximal half.

This species is related to *discalis*, differing immediately by the absence of pollinose bands on the abdominal segments. The first basal cell averages darker than in all the other species of this group.

***Phyoconops (Phyoconops) aureoscutellatus* (Kröber)**

Conops aureoscutellatus Kröber, Stettiner Ent. Zeit., vol. 98, p. 96, 1937.

This species has not been seen but presumably it belongs here. It was described as being similar to *angustifrons* except for the yellow scutellum.

RANGE: Costa Rica.

***Phyoconops (Phyoconops) discalis* (Williston)**

Conops discalis Williston, in Godman and Salvin, Biologia Centrali-Americana, Diptera, vol. 3, p. 80, 1892.

Conops formosus Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 124, 1915.

Conops brachyrhynchus var. *semifuscus* Banks, Ann. Ent. Soc. Amer., vol. 9, p. 192, 1916.

The male cotype (AMNH) from Teapa, Tabasco, México, has been examined. Williston's description of the male as "face blackish, in the depression yellowish" does not fit this specimen and may be an error. The face is yellow, with darker yellowish grooves and brown cheeks. There may be another cotype male which belongs to what I am considering a melanistic form. This form (*formosus* Kröber) has the face black, but the grooves are yellowish. The type of *formosus* in the Vienna Naturhistorisches Museum, Vienna, has been checked for me by Dr. Helmut Mayer.

Recent examination of a large series of specimens from México reveals so much intergradation between this species and *semifuscus* that the latter can no longer be maintained. In South America, typical *discahis* is again replaced by a yellow-cheeked form which is almost indistinguishable from *semifuscus*.

RANGE: United States (Texas, Utah, New Mexico, Arizona), México, Guatemala, Costa Rica, Brazil, Bolivia, Paraguay, Argentina.

Physoconops (Physoconops) obscuripennis (Williston)

Conops obscuripennis Williston, Trans. Connecticut Acad. Arts Sci., vol. 4, p. 328, 1882.

Conops brachyrhynchus (Authors, not Macquart).

Conops foxi Van Duzee, Proc. California Acad. Sci., vol. 16, p. 574, 1927.

The western variation (*foxi*) has the posterior margin of the wing hyaline and is relatively paler brown behind the third vein.

RANGE: Massachusetts to Florida, west to British Columbia, Washington, Colorado, and Texas.

Physoconops (Physoconops) nitens, new species

DESCRIPTION: Male: Length 9 mm. Front opaque black, somewhat reddish below. Vertex blackish red, slightly yellow pollinose in front of ocellar swelling. Face reddish yellow with a narrow black margin extending to the cheeks. Facial grooves dark, cheeks yellowish pollinose, and orbits golden yellow pollinose. Antennae yellow on segments 1 and 2, narrowly black dorsally on segment 2. Antennal segment 3 rufous. Arista rufous except for black on the tip. Proboscis blackish, $1\frac{1}{2}$ times head height. Occiput blackish, yellow pollinose narrowly below on the orbital margin and below the vertex. Thorax black, faintly yellow pollinose more distinct medial to the humeri, propleurae, at base of wings, on metanotum, and lower pleurae. Legs reddish brown, yellowish on anterior femora, base and tip of midfemur and posterior femur, basal third of tibiae, tarsi except sides, claws except tips, and pulvilli. Wings with pattern not as dark as usual, extending from costa to third vein. Very faint at first basal cell and paler in submarginal cell distally along the third vein. Remainder of

wing hyaline. Calypters yellowish. Halteres yellowish, tips brown. Abdomen black, segment 2 reddish black. Yellow band at junction of segments 2 and 3. Narrow yellow pollinose distal margins on segments 3-5. Segments 6 and 7 nearly entirely gold pollinose. Genitalia reddish black.

Female: Length $8\frac{1}{2}$ mm. Similar to the holotype male, but more blackish. Black on face more extensive. Facial grooves dorsally with bilateral shiny spot. Rufous on face confined to bilateral spot below base of antennae. Checks rufous, theca long, blackish. Abdominal segment 2 black.

Variation (in paratypes): Length $7\frac{1}{2}$ -10 mm. One male, similar to the type, but black more extensive. Checks blackish. Antennal segment 2 twice length of segment 1. One male similar to the holotype male but antennal segments 1 and 2 as rufous as segment 3. Front yellowish except stripe above base of antennae giving the black pattern a T shape. Hyaline area of wings darker, so that pattern extends into first basal cell, but is paler than in submarginal cell. One male, similar to the holotype male, but black areas darker. One male, similar to the holotype male, but antennae more rufous, dark areas more blackish. Black of face extends as a narrow stripe onto the cheeks. One male, similar to the holotype male, but reddish on front more yellowish giving the black a T shape. Pollen on abdomen relatively indistinct. One male, similar to the type, but black areas darker, front with dark yellowish red leaving a black T. One male, similar to the type, but with yellowish rim on front leaving black T. Antennae more rufous.

TYPES. Holotype, male (USNM 62431), Maracaju, Mato Grosso, Brazil, May 1937, R. C. Shannon. Allotype (BM), Nova Teutonia, Santa Catarina, Brazil, June 3, 1939, F. Plaumann. Paratypes: Brazil: 2 males (BM), Nova Teutonia, June 12, 1939, F. Plaumann; 1 male (BM), Nova Teutonia, June 6, 1937, F. Plaumann; 1 male (BM), Nova Teutonia, June 2, 1939, F. Plaumann; 1 male (AMNH), Nova Teutonia, June 5, 1939, F. Plaumann; 1 male (AMNH), Nova Teutonia, May 30, 1939, F. Plaumann; 1 male (AMNH), Nova Teutonia, F. Plaumann.

REMARKS: This very distinctive new species is immediately recognizable by the yellowish rufous antennae.

Physoconops (Physoconops) varipes (Kröber)

Conops angustus var. *varipes* Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 153, 1915.

This form has not been seen, but is here considered a full species. It is related to *discalis*, *infuscatus*, and *angustus*, but has a black T pattern on a yellow front.

RANGE: Paraguay.

Physoconops (Physoconops) angustus (Kröber)

Conops angustus Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 152, 1915.

This name is used here for a form related to *nigromarginatus* as distinguished from the *discalis-infuscatus* group. In *nigromarginatus*, the front is usually narrower, the first basal cell is entirely hyaline, and the theca is short; while in the *discalis-infuscatus* group the front is wider, the first basal cell usually partly or entirely clouded, and the theca is relatively long.

RANGE: Argentina and Brazil.

MATERIAL EXAMINED: Brazil: Nova Teutonia, Sept. 4, 1938, F. Plaumann, 1 female (BM).

Physoconops (Physoconops) nigromarginatus (Kröber)

Conops nigromarginatus Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 151, 1915.

This species is somewhat variable over its extensive range, but represents a distinct entity, easily recognized by the dark first posterior cell and very hyaline basal cells. The relatively narrow front distinguishes it (and *angustus*) from the *discalis-infuscatus* group as well as from the *anthreas-ornatifrons* group. From the *angustifrons* group it is readily distinguished by the dark cheeks.

RANGE: México, Brazil, Bolivia.

MATERIAL EXAMINED: Bolivia: Mapiri, 1 male (cotype, USNM). Brazil: Campinas, Goyaz, Jan. 2, 1936, Burgmeyer and S. Lopes, 1 female (USNM); Rio de Janeiro, Dec. 12, 1915, J. G. Foetterle, 1 male, 1 female (USNM); Grajahú, Rio de Janeiro, Aug. 20, 1939, July 18, 1937, Sept. 22, 1937, S. Lopes, 1 male, 2 females (USNM); Bóia Vista, Tapajós, Pará, Townsend, 1 female (USNM). México: San Rafael, July 1, Townsend, 1 male (USNM).

Physoconops (Physoconops) anthreas (Williston)

Conops anthreas Williston, in Godman and Salvin, Biologia Centrali-Americana, Diptera, vol. 3, p. 80, 1892.

Conops mexicanus Kröber, Arch. Naturg., vol. 81, Abt. A, Heft 5, p. 128, 1915.

This and the following species are closely related, and intergradation probably will be found. They have a relatively wider front than the *nigromarginatus* and *angustifrons* groups, and a dark first posterior cell and short theca in contrast to the *discalis-infuscatus* group.

RANGE: México.

MATERIAL EXAMINED: México: Atoyac, Vera Cruz, April, H. H. S., 1 male (cotype, AMNH).

Phyoconops (Phyoconops) ornatifrons (Kröber)

Conops ornatifrons Kröber, Arch. Naturg., vol. 81, Abt A, Heft 5, p. 148, 1915.

The cheeks are black in this species, but in some individuals, especially females, the black may be restricted to a small mark.

RANGE: Venezuela, Brazil, Perú.

MATERIAL EXAMINED: Venezuela: Antimano, June 12, 1926, H. Box, 1 female (USNM). Brazil: Maracaju, July 1937, R. C. Shannon, 1 male (USNM); May, 1937, R. C. Shannon, 23 males, 2 females (USNM); Rio de Janeiro, H. S. Lopes, 1 male (USNM); Campinas, Goyaz, collectors Borgmeier and Lopes, 1 male (USNM); Nova Teutonia, June 3, 1939, F. Plaumann, 3 males (AMNH); Nova Teutonia, June 3, 1939, June 1, 1939, F. Plaumann, 4 males, 1 female (BM); Amazon, 1 specimen (abdomen off, BM). Perú: Ucayali R., 1 male (cotype, USNM); Chosica, May 9, Townsend, 1 male (USNM); Verrugas Canyon, July 9, 1913, Townsend, 1 male (USNM); Lima, January 1949, Aguilar, 1 male (USNM).

Key to New World species of *Conops*, *Mallochoconops*, and *Phyoconops*

1. Wing pattern rufous to reddish brown at least at base 2
Wing pattern black to yellowish brown, or absent 10
2. Head entirely reddish or yellowish 3
Head with some black 5
3. Larger, 20–21 mm. *P. ramondi* (Bigot)
Smaller, 10–12 mm. 4
4. Abdominal segment 2 entirely or partly black. *P. pictus* (Fabricius)
Abdominal segment 2 entirely reddish *P. rufipennis* (Macquart)
5. Face with black 6
Face yellow. 7
6. Abdomen with yellow at junction of segments 2 and 3 . *P. hermanni* (Kröber)
Abdomen with yellow at distal margins of most segments.
C. verus, new species
7. Cheeks dark; complete postvertical pollinose stripe.
P. parsonsi, new species
Cheeks yellow; no complete postvertical stripe 8
8. Front entirely dark *P. pallipes* (Eymelt)
Front mostly yellowish 9
9. Distal abdominal segments dark reddish *P. cubanus* Parson
Distal abdominal segments black *P. bahamensis* Parson
10. Wing without dark pattern; hyaline or yellowish brown anteriorly. 11
Wing with dark pattern or entirely dark 13
11. Head with black spot at frontofacial junction *C. bermudensis* Parson
Head without such spot 12
12. Antennal segment 3 much longer than segment 2 . *M. atratulus* (Malloch)
Antennal segment 3 much shorter than segment 2 . *P. inornatus* (Williston)
13. Wing pattern interrupted in submarginal cell, but may be dark distally; not extending beyond third vein 14
Wing pattern filling submarginal cell, but may gradually pale distally. 16
14. Front entirely black, or partly reddish 15
Front yellow with dark T-pattern or midline *P. abruptus* (Kröber)

15. Antennal segment 3 much shorter than segment 2 . *P. gilmorei*, new species
 Antennal segment 3 as long as segment 2 *P. abbreviatus*, new species
16. Face entirely black, may have yellow pollen in certain lights 17
 Face with yellow at least in grooves 19
17. Thorax dark, with faint white pollinose midstripe *C. nobilis* Williston
 Thorax without white midstripe 18
18. Thorax reddish with golden pollen *C. brunneosericeus* Kröber
 Thorax dark with reddish markings *C. velutinus* Kröber
19. Face predominantly black, but may be covered with light pollen 20
 Face predominantly yellow or reddish 26
20. Size, 18–25 mm. *P. magnus* (Williston)
 Size, 12–15 mm. 21
21. First basal cell dark 22
 First basal cell nearly or entirely hyaline 24
22. Facial grooves entirely or partly black; genital segments unusual.
P. apicalis, new species
 Facial grooves predominantly yellow pollinose; genital segments normal . . 23
23. Antennal segment 3 nearly equal segment 2 *P. travassosi*, new species
 Antennal segment 3 much shorter than segment 2 .
P. infuscatus, new species
24. Antennal segment 3 at least three-fourths of segment 2; front wider than
 high *P. costaricensis* (Kröber)
 Antennal segment 3 at most two-thirds of segment 2; front not wider than
 high 25
25. First posterior cell mostly dark *P. nigromarginatus* (Kröber)
 First posterior cell hyaline *P. discalis* (Williston)
26. Front entirely black 27
 Front with yellow or reddish 45
27. Cheeks black or brownish, darker than face. 28
 Cheeks same as face, but may have small dark area 36
28. Antennal segments 2 and 3 subequal 29
 Antennal segment 3 much shorter than segment 2 31
29. First posterior cell mostly dark 30
 First posterior cell hyaline except for anterior margin.
P. antennatus (Kröber)
30. Most segments of abdomen with posterior pollinose margin.
P. bulbirostris (Loew)
 Only segments 1 and 2 with pollinose margin *P. travassosi*, new species
31. First posterior cell mostly dark 32
 First posterior cell mostly hyaline 34
32. Pollinose pleural stripe separated from humeral spot.
P. nigromarginatus (Kröber)
 Pollinose pleural stripe connected with humeral spot 33
33. Yellow pollen on front diffuse *P. anthreas* (Williston)
 Yellow pollen on front distinct, forming two spots which may be joined.
P. ornatifrons (Kröber)
34. First basal cell as dark as wing pattern *P. infuscatus*, new species
 First basal cell hyaline, or paler than wing pattern 35
35. First basal cell usually partly darkened; male with distinct abdominal rings;
 theca long *P. discalis* (Williston)
 First basal cell entirely hyaline; male with indistinct abdominal rings; female
 theca short *P. angustus* (Kröber)
36. Antennal segment 3 longer or about equal to segment 2 37
 Antennal segment 3 distinctly shorter than segment 2 41

37. Antennal segment 3 much longer than segment 2 . *P. ocellatus* (Giglio-Tos)
 Antennal segment 3 not longer than segment 2 38
38. Wing pattern interrupted by transverse hyaline stripe.
 P. sylvosus (Williston)
 Wing pattern not interrupted 39
39. Large species, 19–23 mm. *P. grandis* (Williston)
 Smaller species, 13–18 mm. 40
40. Legs dark *P. guianicus* (Curran)
 Legs rufous *P. floridanus*, new species
41. First posterior cell hyaline 42
 First posterior cell darkened 43
42. Wing pattern distinctly paler anterior to second vein. Cheeks never with
 any black *P. angustifrons* (Williston)
 Wing pattern not much paler before second vein . . . *P. discalis* (Williston)
43. Front and vertex entirely dark 44
 Yellow markings at junction of front and vertex . . . *P. ornatifrons* (Kröber)
44. Wing pattern diffuse *P. obscuripennis* (Williston)
 Dark of wing distinct from hyaline areas . . . *P. nigromarginatus* (Kröber)
45. Front with sharply defined T-shaped pattern 46
 Front without sharply defined T-shaped pattern . . . 53
46. Antennal segment 3 much longer than segment 2 . . . *P. costatus* (Fabricius)
 Antennal segment 3 not longer than segment 2 47
47. Antennal segment 3 nearly equal to segment 2, at least three-fourths . . . 48
 Antennal segment 3 much shorter than segment 2, less than two-thirds . . 49
48. Front nearly filled by T pattern *P. pictifrons* (Kröber)
 Front not nearly filled by T pattern *P. gracilior* (Kröber)
49. Posterior femur mostly reddish *P. nigrimanus* (Bigot)
 Posterior femur mostly black 50
50. Cheeks yellow 51
 Cheeks dark 52
51. Antennae dark *P. peruvianus*, new species
 Antennae rufous *P. nitens*, new species
52. Antennae reddish *C. ornatus* (Williston)
 Antennae dark *P. varipes* (Kröber)
53. First posterior cell without dark pattern; except along vena spuria, and some-
 times at very base. 54
 First posterior cell with some of dark pattern 56
54. Antennal segment 3 as long as segment 2 *P. shannoni*, new species
 Antennal segment 3 much shorter than segment 2 55
55. Cheeks yellow *P. fronto* (Williston)
 Cheeks dark *P. infuscatus*, new species
56. Cheeks dark 57
 Cheeks yellowish 62
57. Complete distinct postvertical pollinose stripe. 58
 No complete distinct postvertical stripe 60
58. Thorax and abdomen mostly rufous *P. townsendi*, new name
 Thorax and abdomen mostly dark 59
59. Abdomen with golden pollen *P. connectens*, new species
 Abdomen with grayish yellow pollen *P. excisus* (Wiedemann)
60. Reddish species *P. rufus* (Williston)
 Dark species 61
61. Pleural stripe connected with humeral spot *P. antennatus* (Kröber)
 Pleural stripe not connected with humeral spot . . . *P. pallifrons* (Coquillett)

