

STUDIES IN ASILIDÆ (DIPTERA)<sup>1</sup>

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While the June-August issue of *Psyche*, containing a review of the genus *Cyrtopogon*, was in preparation a similar study by C. Howard Curran appeared in the *Canadian Entomologist*, April to October. In the paper in *Psyche* I described seven new species of *Cyrtopogon*, and Curran's paper included twelve new species. This curious coincidence in the selection of a genus for review might have resulted in unfortunate additions to synonymy, but such is not the case, for among the nineteen new species described neither Curran nor myself chanced upon the same forms.

Two reflections are pertinent in this connection. First, there should be some clearing house where investigators could report their intended activities and thus be notified if the field is preempted. Possibly the National Research Council will in time function in this capacity for all America, or better for all nationalities. With reference to my own studies twice before have other workers independently selected the same groups for review, referring to Malloch's *Agromyzidæ* and to Cresson's *Sciomyzidæ*, which papers were in the printers' hands coincidentally with manuscripts of mine. Second, the fact that two workers discover nineteen new species in a well-known genus of an eagerly sought family without conflicting with each other shows that much more is still to be done in systematic dipterology than we are wont to realize.

With regard to the two new genera described by Curran both have a slender, tapering, third antennal joint with long style. *Comantella* was established for two species, *cristata* Coquillett and *fallei* Back, hitherto assigned to *Cophura*, and because *fallei* was regarded as the same as *Cyrtopogon maculosus* Coquillett the last-named species was designated as the genotype.

<sup>1</sup>Contribution from the Zoology Laboratory of the State College of Washington.

I have nineteen specimens of *Cyrtopogon maculosus*, in none of which is there a trace of the curved claw-like spur at the apex of the front tibiæ. I also have another specimen, almost indistinguishable from the others, which has the spur strongly developed. This last specimen I refer to *fallei* in the genus *Comantella*. *C. falliei* has the fork of the third vein located before the posterior crossvein and the anterior crossvein at nearly three-fourths the length of the discal cell. Its bristles are stronger, the pygidium longer and the thoracic gibbosity more compressed than in *maculosus*, which has the anterior crossvein at the middle of the discal cell and the fork of the third vein opposite the end of this cell. *Maculosus* is referable to Curran's new genus *Eucyrtopogon*. The genotype of *Comantella* is therefore *fallei* Back, synonym *maculosus* Curran, not Coquillett. Instead of being a highly variable character the terminal claw-like spur maintains its dignity as an "atavie index" to the two main subdivisions of both the Dasyopogoninæ and the Laphrinæ.

*Key to the North American Species of Cophura.*

- Wings dark; abdomen and legs more or less reddish . . . . . 2.  
 Wings more or less hyaline; abdomen black or blue-black,  
 with pollinose spots . . . . . 4.
2. Three deep black stripes on notum, the middle one geminate;  
 wings uniformly brown; abdomen reddish-yellow. (Mex.)  
 . . . . . *sodalis* O. S.  
 Thoracic stripes brownish; wings in part clear toward  
 apex . . . . . 3.
3. Legs black, the knees, base of tibiæ and part of tarsi  
 yellow; abdomen brown-black, the hind margins of  
 segments narrowly reddish. (Mex.) . . . *humilis* Will.  
 Legs reddish, anterior femora darkened on outer posterior  
 side; abdomen red, laterally white pruinose. (Tex.)  
 . . . . . *bella* Lw.
4. Pollinose marks of abdomen large, extending along sides  
 and more or less across front part of segments; tibiæ  
 reddish . . . . . 5.

- Lateral pollinose marks of abdomen not extending across front part of segments. . . . . 7.
5. Wings clouded on crossveins and furcations, base of second submarginal cell truncate and with a spur of a vein. . . . . 6.  
Wings hyaline, no spur at fork of third vein, anal cell closed and petiolate. (Cal.) . . . . . *clausa* Coq.
6. Anal cell open. (Cal.) . . . . . *trunca* Coq.  
Anal cell closed in the margin; lateral pollinose marks of abdomen each with central black shining spot. (Cal.) . . . . . *highlandica* Cole.
7. Legs red; oral and trichostical bristles black. (Wash., Or., Wyo.) . . . . . *brevicornis* Will.  
Legs entirely black. . . . . 8.
8. Oral bristles black. . . . . 9.  
Oral hairs white. . . . . 10.
9. Crossveins and furcations tinged with brown; pruinosity of thorax brownish, bristles pale, scutellar margin narrowly black and with six pale hairs; abdominal segments scarcely pruinose at base. (Wash., Or.) . . . *scitula* Will.  
Wings clear hyaline; pruinosity of thorax grayish, bristles black, scutellar margin broadly black and with two short black setæ; abdominal segments with basal pruinose fascia. (Id.) . . . . . *melanochæta*, n. sp.
10. Wings tinged with brown; mesonotum marked with brown broad geminate median stripe and lateral spots. (Mex.) . . . . . *pulchella* Will.  
Wings nearly or wholly hyaline; mesonotal pattern nearly obsolete. . . . . 11.
11. Mesonotum nearly bare; pygidium white-pruinose. (Ariz.) . . . . . *fur* Will.  
Mesonotum whitish pilose; pygidium polished. (*cyrtopogona* Cole) (B. C., Wash., Or.) . . . . . *albosetosa* Hine.

The genus *Cophura* has been heterotypic, serving to combine various species that run to it in the keys, without regard to their phylogeny. The separation of *Comantella* helps to unify the group, but it is still diverse. The species are considered rare, only the type material being known of most of its forms. I

have taken *brevicornis* near Spokane, in the Olympic Peninsula and near Mount Adams, in Washington; at Portland, Oregon; and in the Yellowstone Park. I have also taken *scitula* at Portland, Oregon, and *albosetosa* at Yakima, Washington. The preceding key differentiates the species assigned to *Cophura*.

***Cophura melanochaeta*, new species.**

*Male*.—Length 6.5 mm. Black, head and thorax cinereous pollinose, abdomen marked with silvery pruinose fasciæ on segments 2-5 and round pruinose spots on hind angles of segments 1-5. Facial hairs sparse, white, oral bristles strong and black, a row of black setulæ along frontal orbits, occipital hairs and setæ white; basal joints of antennæ rounded, with strong black inferior setæ, third joint widest beyond middle, three times the length of either basal joint, the style three-jointed, including its apical peg-like joint as long as a basal joint of the antennæ. Mesonotum with dense pollen, darker gray in center, its vestiture short black recumbent setulæ, lateral bristles black, base of scutellum heavily light-gray pollinose, only two short black apical setæ, middle of metanotum lightly pollinose. Abdominal hairs inconspicuous, pale, those at base of the small pygidium dark; ventral segments mostly shining black, each gray-fasciate at base and apex. Leg bristles black, hairs pale, inside of distal half of hind tibiæ and of basal two joints of hind tarsi thickly yellow pubescent. Halteres yellow; wings entirely hyaline, veins black, clear-cut, fork of third vein a little beyond discal cell, anterior crossvein slightly beyond middle of discal cell, anal cell open.

*Female*.—Length 10 mm.

A pair taken at Waha, Idaho, 12 Aug. 1923; another female, Moscow Mt., Idaho, Jul. 8.

*Key to the Species of Metapogon.*

- Legs in part reddish; wings more or less clouded on crossveins . . . . . 2.  
 Legs black, at most knees reddish; wings not marked about crossveins; antennæ black . . . . . 4.

2. Antennæ black; anterior crossvein at middle of discal cell; pluræ with golden spots. (Cal.).....*pictus* Cole.  
Base of antennæ yellow; anterior crossvein beyond middle of discal cell. . . . . 3.
3. Abdomen with large triangular pollinose marks; bristles yellow; femora reddish. (Cal.).....*gilvipes* Coq.  
Abdomen polished, with gray pruinose spots at base of segments 2-6; bristles black; femora black except knees. (N. Mex.).....*punctipennis* Coq.
4. Mainly black, abdomen with small pruinose spots; wings of male white on basal half, lightly infumated apically, of female uniformly lightly infumated; mystax stiff and black. (Wash., Id., Or., Cal.).....*setiger* Cole.  
Body mainly cinereous, base of abdominal segments black; wings hyaline; mystax white. (Wash.)..*albulus*, n. sp.

#### **Metapogon albulus**, new species

*Male*.—Length 7 mm. Black, entirely and heavily coated with silvery gray pruinosity, leaving only the bases of abdominal segments showing black. Bristles of face and front white, ocellar bristles black; third antennal joint widest at three-fifths its length, the style almost microscopic, setæ below basal joints of antennæ black; beard sparse and white, upper part of occiput bare except for the row of white setæ. Bristles of anterior part of thorax white, of posterior part black, four or five stout bristles in dorsocentral row, posthumeral bristle present, white, two supraalar bristles, scutellum with two marginal bristles, otherwise bare, two to five hypopleural setæ, pleuræ devoid of pile except on prothorax. Pile and setæ at sides of first abdominal segment white, remaining segments with very sparse short white hairs, base of segments two to five very narrowly devoid of pruinosity, hypopygium small black and inserted in the end of the cylindrical abdomen, its hairs pale and rather sparse; venter entirely glaucous. Legs black, the coxæ alone pruinose, knees very narrowly yellowish, femora with a few small white flexor bristles, bristles of tibiæ white except those at apex, tarsal bristles black, claws black, pulvilli brownish, hairs of legs

sparse short and white. Halteres yellow; wings almost hyaline, veins dark brown, becoming paler at root, hind margin closely fringed with fine hair, anterior crossvein at two-fifths the length of the discal cell, anal cell open.

*Female*.—Bases of abdominal segments two to six with broader black fasciæ, seventh segment lightly black, venter with triangular black denuded marks increasing in size posteriorly, the sixth segment entirely black, some of tibial bristles blackish.

*Types*.—Six specimens Pullman, Washington, and Collins, Idaho (C. V. Piper) July and August. Type in collection of State College of Washington.

*Key to Species of Dioctria.*

- Femora wholly black, the tibiæ alone sometimes reddish... 2.  
 Femora and rest of legs wholly or largely yellow or red;  
 mystax pale..... 11.
2. Mystax fulvous and dense; body brilliant greenish black.  
 (Cal.)..... *resplendens* Lw.  
 Mystax generally black, rarely white, if fulvous not dense;  
 body less brilliantly metallic..... 3.
3. Third joint of antennæ one and one-half times the length  
 of the two basal joints together and cylindrical (*Banksi*  
*Johns.*)..... 4.  
 Third joint of antennæ subequal to basal joints together. .. 5.
4. Legs wholly black. (Va.)..... *Banksi* Johns., s.str.  
 All tibiæ reddish on basal half. (Va.).. var. *tibialis* Banks
5. Legs wholly black..... 6.  
 Tibiæ more or less reddish-yellow..... 9.
6. Wings yellowish on basal half, blackish on apical half.  
 (Cal.)..... *parvula* Coq.  
 Base of wings not markedly yellowish..... 7.
7. Upper plate of hypopygium wide, with two broad lobes;  
 fulvous coat of mesopleura extending along upper edge  
 only. (Eastern U. S., doubtful if in West). *albius* Walk.  
 Upper plate of hypopygium narrow, pronged but not with  
 flat lobes..... 8.

8. Upper plate divided into two long tapering parts ending in a knob-like enlargement, with a tooth on inner surface and a pencil of yellow hair on outer edge (N. Y.; N. Car.).....*brevis* Banks  
 Upper plate a slender finger-like undivided projection about four times as long as wide and with parallel sides, lateral arms short and heavy. (Cal.; Wash.) *media* Banks
9. Tibiæ except tips reddish-yellow; notum heavily coated with fulvous, abdomen metallic violaceous; large species, 11-13 mm..... 10.  
 Only base of tibiæ yellowish; mesopleural pollen extending down along posterior edge; face of male silvery, of female golden; 7-9 mm. (Wash., Id.,; doubtful if East) .....*sackeni*, form *rivalis* new
10. Mesopleural pollen along upper edge only; face of both sexes brassy. (Cal., Wash.).....*nitida* Will.  
 Mesopleura with dense fulvous pollen and pile extending down along posterior edge; face of male silvery. (Cal.) .....*doanei*, n. sp.
11. Abdomen wholly black; femora with black line above... 12.  
 Abdomen in part reddish, at least with lateral spot or incisures reddish; femora wholly yellow; thorax polished black..... 14.
12. Mesonotum densely coated with golden pollen; wings largely yellow. (Ida., Wash., Or.; if eastern in distribution, probably dimorphic form of *albius* Walk.) .....*sackeni* Will.  
 Mesonotum thinly coated with yellow pollen, leaving two narrow black lines..... 13.
13. Face silvery, mystax white; wings hyaline. (Eur.; Mass.) .....*baumhaueri* Mg.  
 Face golden, mystax yellow; wings dark. (Cal.) *vera* Back
14. Coxæ black; abdomen reddish, first four segments more or less black; arista one-sixth the third antennal joint; wings blackish. (Cal.).....*rubida* Coq.  
 Coxæ yellow; style one-fourth to one-half the third antennal joint; wings lighter; hind metatarsus swollen, equal to next three joints in length..... 15.

15. A yellowish pollinose stripe extending from base of wings to front coxæ; abdomen dull rufous, segments with indistinct black near middle; arista one-fourth the third antennal joint. (Cal.).....*pleuralis* Banks.  
Pollinose spot above front coxa disconnected; arista longer.....16.
16. Abdomen largely dull reddish; legs reddish. (Cal., Col.)  
.....*pusio* O. S.  
Abdomen largely black, legs pale yellow.....17
17. Abdomen black and yellow banded. (Or. Wash.)  
.....*vertebrata* Cole  
Abdomen narrowly fasciate with reddish and with red spot on sides of second segment. (Wash.)  
.....*henshawi* Johnson

***Dioctria doanei*, new species.**

*Male*.—Length 14 mm. Robust, black, abdomen bronzed, tibiæ luteous, vestiture dense, yellow. Face silvery, mystax black, vertex and occiput golden, hairs yellow; antennæ elongate, black, third joint a little longer than the basal two together. Thorax coated with fulvous pollen, especially pronounced on posthumeral areas, scutellum black, lateral bristles of notum fine and yellow; meso- and sternopleuræ largely polished. Anterior part of abdominal segments 2-4 sunken, pile of apical segments appressed, deep golden, becoming almost reddish beneath pygidium. Legs strong, hind femora robust, coxæ, femora, tips of tibiæ, and tarsi black, bristles of tibiæ and tarsi reddish, pulvilli brown, claws black. Wings strongly and uniformly infumated, discal cell widened apically, anterior crossvein before its middle and fork of third vein just beyond its end, sixth vein curving forward, anal cell narrowly open; halteres yellow.

Two specimens collected by Professor R. W. Doane at Pasadena, California, June 6, 1895. Type in collection of the State College of Washington. The dense pilosity and constricted abdominal segments suggest *Dicolonus*, but the head is different, the vertex being deep-set and the face flat.



***Dioctria sackeni*, new form *rivalis*.**

*Male*.—Length 7 mm. Basal half of wings smoky hyaline, distal half merging into blackish; legs black, the anterior knees and the basal half of hind tibiæ reddish yellow. Face entirely silvery, mystax, hairs of front, of antennæ and of upper occiput black, vertex with scant fulvous coating and not golden. Coating of mesonotum fulvous and not heavy, hairs black; the golden patch in front of wing connected with the more silvery patch on upper sternopleura. The appressed hairs on posterior half of abdomen black, not golden as in form *Sackeni*; dorsal plate of hypopygium continued posteriorly as two long narrow clavate processes, each tipped without by a closed cluster of black bristles and bearing on inner side of knob a pronounced parallel-sided prong, long black hairs on ventral lip and on stout lateral valves. In *Sackeni* hairs fringing the ventral lip are brown.

*Female*.—Length 8 mm. Face deep golden. Wings uniformly blackish. Legs black.

*Morphotypes*.—Priest Lake, Idaho, Aug. 1920; Coeur d'Alene, Moscow Mt., Avon, Id.; Big Fork, Mont.; Friday Harbor, Quilcene, Wash.; Nelson, B. C. (Melander): Stuart Island, Wash. (H. S. Davis); Wolf Fork of Touchet River, Wash. (V. Argo). Thirty-two specimens.

Late one afternoon while collecting insects at Priest Lake, Idaho, I noticed many specimens of a *Dioctria* running over the foliage of some alder bushes growing near the water's edge. On mounting the captured specimens there were found to be seven males of *D. Sackeni*, four males of the present black form and nine black females. The only interpretation is that *Sackeni* is dimorphic in the male sex. I have also taken the lighter colored male of *Sackeni* together with the dark female at Nelson, B. C.

Light-colored males, similar to *D. Sackeni*, have been found associated with the dark *albius* in several places in the East. Dr. Back ventured the opinion that *Sackeni*, therefore, might prove to be the same as *albius*, but the recent note by Banks that the Eastern reddish males have genitalia of the *albius* structure suggests that male dimorphism in *Dioctria* is probably

extended to several species. The Pennsylvania female with hyaline wings recorded by Johnson in *Psyche*, 1918, p. 103, as undoubtedly belonging to *Sackeni*, is more likely a distinct species.

**Neopogon salinus**, new species.

*Male*.—Length 9 mm. Entirely densely covered with whitish-gray pollen, abdomen incompletely fasciate with blackish-gray. Antennæ cinereous, the style three-fourths the length of the third joint, mystax, hairs and postvertical row of bristles white. Hairs of mesonotum short and white, slightly longer on sides, scutellum bare; a few hairs on propleuræ, pleuræ otherwise bare, about eight setiform hairs in hypopleural row. First, fourth and eighth abdominal segments almost wholly whitish-gray, remaining segments with transverse blackish-gray marking, pile and bristles at sides of first segment white, hypopygium small, silvery, and white pilose, the hood-like covering pink and penicillate below, venter white-gray, bare at base, last four segments with double brush of yellowish-white hairs directed to the middle and covering a subshining space. Legs as heavily coated as body, nearly bare of hairs, bristles mainly white, claws, empodia and some of tarsal bristles black, pulvilli white. Halteres whitish yellow. Wings hyaline, with very faint yellowish tone, veins black, yellowish at base, neuration normal.

*Female*.—Length 10 mm. Darkened markings of abdomen present on second to sixth segments, ovipositor, *i. e.* eighth ventral segment, shining beneath, tarsal bristles all white.

*Types*.—Six specimens collected by Dr. J. M. Aldrich at Great Salt Lake, Utah, July 31, 1908. Type, allotype and two paratypes returned to the Aldrich collection. The species runs to *N. Coquilletti* in Bezzi's table (*Ann. Hung. Mus.* 8. 147-153, 1910) but that species has the abdomen colored as in the familiar *N. trifasciatus*, with a strong white band on fourth segment, the second and third segments dull black, and the fifth, sixth and seventh segments shining black.

**Nicocles punctipennis**, new species

Length 12 to 13 mm. Black species, with hyaline wings marked with dark spots around the discal cell and with brownish clouds at the tips of the veins. Fifth segment of male about twice as wide as deep, its front border and the sixth segment silvery. Last three segments of the female abdomen respectively with a pair of gray pruinose triangles, a pair of squares, and entirely gray pruinose. Hind tarsi of male silvery within. Antennal style one-third the length of the third joint. Three strong lateral presutural bristles, two supra-alar, two or three postalar.

*Male*.—Face, front and occiput gray-white pruinose; facial hairs fine, white, comparatively dense, extending to the antennæ, long below, bristles of mystax yellowish, oral, ocellar, and post-ocular bristles yellowish brown; beard and palpal hairs white; face nearly square, and but little convex. Antennæ black, the basal segments subequal, and provided with white hairs, the second segment with a conspicuous light brown bristle below, the third segment nearly twice as long as the basal joints together, slender, cylindrical, little tapering, three times as long as the thick style. Upper side of the thorax with an irregular gray-brown pattern, showing gray, however, on the narrow median entire stripe, on each side of which is a narrow line, abbreviated posteriorly and on the humeri, scutellum, a large square prescutellar spot, with a triangular space on each side, and a curved sutural stripe extending up above the root of each wing. This sutural stripe does not continue across the notum, but stops on the row of dorsocentral bristles, where it connects with gray horns from the anterior angles of the prescutellar spot. The brown color is not uniform, and is darkest as an interrupted vitta crossing the interior end of the gray sutural stripe. The oval center of the prescutellar spot is denuded and shows the polished black ground color of the thorax. Mesonotal hairs very fine, and rather sparse and long, pale yellowish, the posterior bristles pale, with brownish base: disc of the scutellum with white hairs, the margin with two cruciate bristles. Pleuræ and coxæ gray pruinose, the center of the mesopleuræ alone brownish; trichostichal hairs long, numerous, and whitish;

halteres black, their stem brown. Abdomen flat, shining black except for the gray lateral margins of the basal three and a half segments, and the silvery tip, which occupies the whole of the last segment and the anterior part of the fifth. On this segment the silvery band is broadly emarginate behind, so that it occupies but one-fourth of the segment at the middle, and then curves down to the hind angles; this segment is but little more than twice as broad as deep. The vestiture of the abdomen consists of very sparse, appressed, golden hairs and longer erect white hairs growing from black pittings on the gray lateral marks. The venter is gray, speckled with brown at the root of each hair. Legs with appressed whitish pubescence and with yellowish bristles, the inner side of the hind tarsi and of the end of the hind tibiæ with dense silvery hairs, anterior tibiæ rufous, rest of legs black in ground color. Wings hyaline, but with dark brown spots located at the very root, on the crossveins, bordering the ends of the veins at the wing-tip, and across the wing at the base of the discal cell as a much interrupted band, broadest and darkest in the marginal cell. The hyaline anal cell is closed in the margin, the posterior cells all open, and the fork of the third vein is broken at the base of the second submarginal cell, and there provided with a spur.

*Female*.—Differs in that the gray covering is less pure, but sullied with brown on the face, front, pleural sclerites and venter. The end of the abdomen lacks the silvery pruinosity, but instead, the fifth segment has lateral gray triangles, the sixth is gray except for a median stripe, and the seventh is completely gray. The pubescence of the legs is duller and there is none of the silvery ornamentation.

*Types*.—Male, Wawawai, Washington, May 1, 1909 (Wm. M. Mann). Two females from same locality, April 10 and 23, and two from Wallula, Washington, April, 1923 (P. G. Putnam.) A female paratype collected by E. L. Jenne, at North Yakima, Washington, September 18, 1903, is in the collection of the Washington State College.

This large and distinct species can be quickly recognized in the male by the concave silvery mark on the fifth abdominal segment, and in the female by the spotting of the wings as well

as by the maculation of the abdomen. In Coquillett's key (page 385, Back monograph, 1909) it goes to the last couplet, but does not conform with either *argentatus* or *æmulator*. The recently described *N. utahensis* Banks likewise goes to the last couplet of the key but differs from the present species in weaker chætotaxy, blacker thorax, and, apparently, much smaller size.



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