

few minutes of the discovery of this fly resulted in the capture of another species of *Trichocera* but no more of the species in question.

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NEW OR LITTLE-KNOWN NEARCTIC SPECIES OF TRICHO CERIDAE
(DIPTERA.) —

PART I.

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The North American species of Trichoceridae belong to three genera, *Diazosma* Bergroth (*subsinuata* Alexander), *Paracladura* Brunetti (*trichoptera* Osten Sacken) and the dominant *Trichocera* Meigen, with numerous species, some of which are widely distributed throughout the Holarctic Region. The scope of the family, its phylogenetic relationships, and a key to the known genera, are all discussed in a recent paper by the writer. (The Trichoceridae of Australia; *Proc. Linnean Soc. N. S. W.*, 51: 299—304; 1926) and need not be considered further at this time.

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The material discussed at this time is in part preserved in the writer's collection, in part in the National Collections of the United States and Canada. I am greatly indebted to the Custodians of the Diptera of these Collections, Dr. Aldrich and Mr. Curran, for the privilege of studying these series. I am also indebted to Messrs. Garrett and Salman for the gift of additional material considered at this time.

The terminology of the venation adopted herein is about as used by the writer in recent papers, with some important changes in the radial field that are being discussed in an extensive paper on this subject. (The interpretation of the radial field of the wing in the Nematocerous Diptera, with special reference to the Tipulidae. *Proc. Linnean Soc. N.S.W.*, in press). The application was stated for the Pedicine Tipulidae (*Ent. News*, 29: 201-205, pl.; 1918) but had not been carried through all the groups of Tipulidae and the phylogenetically higher Diptera. This modification, as it regards the Trichoceridae, may be briefly stated as follows:

The key to this problem was found in certain generalized types of Pedicine crane-flies which are not strikingly different from the Tanyderidae. There are two distinct tendencies of specialization in this field of the wing, the first of which has been termed "the cephalization of vein R_2 ." The anterior branch (R_2) of the upper fork of the sector (R_{2+3}) has swung cephalad and fused with vein R_1 for a short to longer distance back from the wing-margin and has thence gradually assumed a transverse position. It is this element, the basal section of R_2 , that has been called the radial crossvein (r) in all groups of Diptera where it occurs. As has been discussed in detail in the paper cited, the radial crossvein in Diptera has never assumed a transverse position, in the few groups where it has been developed (as Tipulinae, Cyliodrominae) always occupying a longitudinal or oblique position. The confusion that has existed and the indiscriminate calling by a single term of two distinct elements of this field will become apparent to anyone who will undertake to critically analyze the situation.

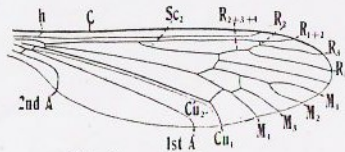


Fig. 1

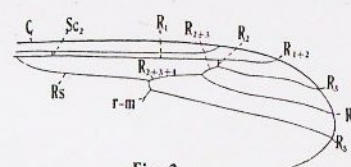


Fig. 2

Wing-venation of *Trichocera fernaldi* sp. n. Symbols: A—Anal veins; C—Costa; Cu—Cubitus; h—humeral crossvein; M—Media; R—Radius; r-m—radial-medial crossvein; Rs—Radial sector; Sc—Subcosta.

The second tendency of specialization in this field has been termed "the capture of vein R_4 by R_{2+3} ." In the hypothetical type of insect and in generalized Diptera, the sector forks twice, dichotomously, the upper fork carrying veins R_2 and R_3 , the lower, R_4 and R_5 . In the groups in question, vein R_4 in different genera and species moves basad, shortening R_{4+5} until the latter is obliterated. Vein R_4 then moves cephalad along vein R_{2+3} , forming a short to longer fusion, R_{2+3+4} (Figs. 1, 2).

In the present paper, I have adopted the Comstock-Needham system of venation, as modified by Tillyard for the cubital field, and for the radial field as discussed above (Fig. 2). In order that the terminology of the Comstock-Needham system may be more readily correlated with the modification herein adopted, I have added a tabulation of all the veins and cells in the radial field.

Comstock-Needham Terminology	Terminology adopted in this paper.
Veins:	
R_1 (first section)	R_1 (first section)
R_1 (second section)	R_1 (second section)
R_1 (third section)	R_{1+2}
R_s	R_s
r	basal section of R_2
R_{2+3}	R_{2+3+4}
R_2 (first section)	R_{2+3}
R_2 (second section)	R_3
R_{4+5} (both sections)	R_5 (both sections)
Cells:	
1st R_1	R_1
2nd R_1	R_2
R_2	R_3
R_3	R_4
R_5	R_5

In the accompanying figure (Fig. 2), the first section of R_1 lies between the origin of R_s and Sc_2 , the second section between Sc_2 and the basal section of R_2 ; R_{2+3+4} is between the fork of R_s and the point of departure of R_4 ; R_{2+3} between the latter point and R_2 ; R_3 beyond R_2 . The other parts are self-explanatory.

The terminology of the male hypopygium used in this and other papers is that of Crampton (*Trans. Amer. Ent. Soc.*, 48: 207-225, 3 pls.; 1923).

Considerable use has been made of the macrotrichiae of the veins and the relative proportions of certain of the veins and deflections. It should be noted that both of these characters vary greatly and can be used only within restricted limits.

Trichocera setosivena, sp. n.

Male.—Length about 6 mm.; wing, 8.2 mm.

Rostrum and palpi dark, the terminal segment of the latter about one-third longer than the penultimate. Antennae with the scapal segments reddish brown, the flagellum dark brown. Head dark brown, paler in front.

Pronotal scutum dark brown, the scutellum conspicuously yellowish. Mesonotal praescutum light brown with four darker stripes, the intermediate pair darker brown, confluent in front but distinctly separated behind, the lateral stripes paler; scutum brownish gray, the lobes extensively dark brown, margined mesally with obscure yellow; scutellum dark, broadly and conspicuously margined with light yellow; postnotum light brown, the cephalic lateral portions of the medioergite yellow. Pleura brown, somewhat darker dorsally to form a diffuse dorso-longitudinal stripe, the ventral portion of the pteropleurite paler. Halteres brown, the base of the stem paler. Legs with the coxae obscure yellow; trochanters yellow; femora brownish yellow, unmarked; tibiae and tarsi slightly darker brown.

Wings with a strong brownish tinge, somewhat more intense in the general region of the stigma and along vein Cu_1 . Macrotrichiae of veins very long and abundant, about equal in length to the basal section of R_2 ; on vein 1st A these trichiae occur the entire length of the vein, on vein 2nd A on all but the distal third. Venation: Sc_1 elongate, a trifle shorter than Rs and about twice the first section of R_1 , ending opposite the basal section of R_2 ; R_{1+2} about one-half the length of Rs ; R_{2+3+4} short, about one-half R_{2+3} ; cell M_1 very deep, about three times its petiole; $m-cu$ sinuous, at the fork of M_{3+4} ; vein 2nd A relatively short.

Abdominal tergites dark brown, the caudal margins of the segments somewhat darker; basal sternites obscure yellow, the outer segments becoming more uniformly darkened; hypopygium dark-colored. Abdomen with conspicuous erect setae. Male hypopygium with the basistyles completely united ventrally, no trace of the suture being apparent. Dististyle simple, cylindrical, the armature of the mesal face very delicate, erect to weakly retrorse; no tubercles or other processes on dististyle. Phallosome a quadrangular plate, the caudo-lateral angles produced laterad and slightly caudad into relatively short, acute spines.

Hab. Alaska.

Holotype, ♂, Seward, July 26, 1921 (*J. M. Aldrich*); U.S.N.M.

This species and the next are well distinguished by the great length and abundance of the macrotrichiae of the wing-veins, which suggest the genus *Diazosoma*. The structure of the male hypopygium requires detailed study. Even under a microscope, no trace of the suture separating the ventro-mesal lobes of the basistyle is apparent and the "bridge" so formed certainly appears to be complete. The phallosome also is different from all described species of the genus, with the exception of *T. major* Edwards, which has quite the same structure. In this latter species, however, the trichiae of the wings are short and normal for the genus.

***Trichocera longisetosa*, sp. n.** => *elavina maineana*

Male.—Length about 4 mm.; wing, 5.5 mm.

Generally similar and closely allied to the last, *T. setosivena*, sp. n., in the long, conspicuous macrotrichiae of the wing veins and the general structure of the hypopygium.

Size much smaller. Mesonotum of type more or less discolored, reddish, the humeral region more yellowish, with a broad median brown stripe; scutellum yellowish testaceous. Pleura and postnotum reddish, the dorso-pleural region and the sternopleurite darker. Legs obscure brownish yellow, the terminal segments of the tarsi darker. Wings with a brownish tinge, the veins and macrotrichiae darker. Macrotrichiae long and conspicuous, as in the last, those adjoining the basal section of R_2 about as long as this vein. Venation: Sc_1 relatively short, about three-fourths Rs , ending some distance before the basal section of R_2 ; R_{1+2} about two-fifths Rs ; second section of R_1 and Rs subequal; R_{2+3+4} a little longer than R_{2+3} ; R_3 sinuous; basal section of R_3 short; cell M_1 deep, about two and one-half times its petiole; cell 1st M_2 with the inner end pointed; $m-cu$ at fork of M_{3+4} .

Abdomen brown, including the hypopygium. Male hypopygium as in *T. setosivena* but with the lateral horns of the phallosome longer.

Hab. Washington.

Holotype, ♂, Lake Cushman, June 27, 1917 (*H. G. Dyar*); U.S.N.M.

***Trichocera columbiana*, sp. n.**

Male.—Length about 5 mm.; wing, 6.5-7.4 mm.

Female.—Length about 7 mm.; wing, 8.5 mm.

Rostrum and palpi dark brown. Antennae with the scapal segments brownish yellow, the flagellum dark brown. Head dark brown or grayish brown.

Pronotum dark brown, the scutellum and anterior lateral pretergites restrictedly yellowish. Mesonotal praescutum reddish brown, with a broad dark brown median area that is sometimes weakly divided, the sides of the sclerite pale, sparsely dusted with gray; scutum reddish brown, the scutellum paling into yellowish; postnotum brownish yellow, darker behind. Pleura chiefly dark brown, especially dorsally, the posterior sclerites more reddish brown. Halteres pale, the knobs dark brown. Legs with the coxae light brownish yellow, in some cases the fore coxae with the outer face darker; femora brownish yellow, the bases clearer yellow; tibiae and tarsi passing into darker brown. Wings with a faint brownish tinge; a small and sometimes poorly defined dark suffusion on $r-m$; stigmal region in some cases a little darkened; veins dark brown. Macrotrichiae short and relatively sparse, more abundant and crowded on the outer veins of the radial field, longer and more conspicuous on the branches of M , especially M_{3+4} ; very weakly developed on the veins basad of the level of the origin of Rs , there being none on the basal half or a little less of the first section of Sc , on about the basal third or fourth of M , the basal sixth of 1st A ; usually none on 2nd A , in the cases where developed, very few in number and of considerable length. Venation: R_{1+2} about one-half Rs or a little less; first section of R_1 variable in length, from one-third to one-fifth the second section; R_{2+3+4} longer than R_{2+3} ; R_3 gently sinuous, subequal to Rs ; cell M_1 deep, more than twice its petiole; vein 2nd A slightly extended.

Abdomen tergites dark brown, the basal sternites bicolorous, the bases of the segments extensively obscure yellow, the margins broadly dusky; the outer sternites are more uniformly infuscated; hypopygium yellowish to brownish yellow. Male hypopygium with the ventro-mesal extension of the basistyles very broad, meeting on the median line to form a wide bridge, the suture well preserved. Dististyle simple, relatively long, without tubercles. Gonapophyses appearing as long, broad-based blades. Ovipositor relatively narrow, yellow, from four to five times as long as wide.

Hab. British Columbia, Alaska.

Holotype, ♂, Prince Rupert, B. C., June 17, 1919 (*H. G. Dyar*); U.S.N.M.

Allotopotype, ♀, with type.

Paratopotypes, 7 ♂ ♀; *paratypes*, 1 ♂. Victoria, B.C., March 28, 1916 (*R. C. Treherne*), Can. Nat. Coll.; 1 ♂, March 8, 1920 (*W. B. Anderson*); 3 ♂ ♀, Metlakatla, B.C., November 9, 1908 (*J. H. Keen*), Can. Nat. Coll.; 1 ♀, Ketchikan, Alaska, June 20, 1919 (*H. G. Dyar*).

***Trichocera fernaldi*, sp. n.** => *4. binacula maineana*

Male.—Length, about 4.5 mm.; wing, 6.5-6.8 mm.

General coloration of head gray. Antennae dark brown, the apex of the second scapal segment paler.

Mesonotal praescutum dark brownish gray, with two darker brown intermediate stripes, the lateral stripes nearly obsolete; scutum dark brownish gray; scutellum dark gray, the caudal margin more reddish brown; postnotum dark gray. Pleura dark gray. Halteres pale, the knobs dark brown. Legs with the coxae and trochanters dark; femora yellowish brown, the tips narrowly infuscated; tibiae and tarsi darker brown. Wings grayish subhyaline, sparsely variegated with darker gray, including a seam at *r-m*, a spot below the origin of *Rs* in cell *R*; narrow seams on *m-cu* and outer end of cell 1st *M*₂ and a pale stigmal area beyond the basal section of *R*₂. Macrotrichiae of veins short and sparse, lacking on about the basal half of veins *M* and 1st *A*; 2nd *A* without trichiae, except in rare cases, when one or two may be present. Venation (Figs. 1 and 2): *Sc*₁ ending about opposite the short basal section of *R*₂; first section of *R*₁ short, only about one-sixth of the second section; *R*₂₊₃₊₄ about two and one-half times *R*₂₊₃; *R*₃ sinuous, shorter than the second section of *R*₁; cell *M*₁ a little longer than its petiole.

Abdomen dark brownish black, the intermediate segments vaguely a little paler on basal half. Male hypopygium with the dististyle cylindrical, without basal tubercle. Gonapophyses elongate.

Hab. Massachusetts.

Holotype, ♂, Amherst, October 22, 1926 (*Alexander*).

Paratopotypes, 5 ♂♂; *Alexander* Coll.

In small swarms among shrubbery on north side of Fernald Hall. This species is named in honor of Prof. H. T. Fernald, to whom I am greatly indebted for many kindnesses and suggestions in the past. The fly is allied to *T. maculipennis* Meig. and *T. bimacula* Walk., in the heavily patterned wings. The former species is very distinct in the coloration of the legs, the femora being yellowish with a narrow subterminal brown ring; wings with cell *R*₃ deep, vein *R*₃ being nearly as long as the second section of *R*₁; macrotrichiae of veins more numerous, including a series on vein 2nd *A*; male hypopygium with a small basal tubercle on mesal face of dististyle. *T. bimacula* Walk. is described by both Walker and Edwards as having the abdomen conspicuously banded with brown and ochreous, a feature that at once separates it from the present species.

Trichocera garretti, sp. n.

Male.—Length about 4 mm.; wing, 6.2—6.5 mm.

Rostrum and palpi black. Antennae black, the distal segments of the flagellum a little paler. Head brownish black.

Mesonotum brownish black, without markings, the scutellum a trifle brighter. Pleura dark. Wings grayish; a broad dusky cloud on *r-m* and the large diffuse stigmal area pale but conspicuous; a paler brown seam along *Cu* and *m-cu*; veins dark brown. Macrotrichiae short and relatively sparse, lacking on about the basal fourth of *M*, basal sixth of 1st *A*, and usually none on 2nd *A*, when present, few in number and of considerable length. The venation of the medial field of the paratype is deformed. Venation: *Sc*₁ ending opposite the basal section of *R*₂; first section of *R*₁ from one-third to one-fourth the second section; *R*₂₊₃₊₄ about one-third longer than *R*₂₊₃; cell *M*₁ about as deep as its petiole.

Abdomen brown, the caudal margins of the segments narrowly darker; hypopygium brownish black. Male hypopygium with the mesal extensions of the

basistyle large and broad, broadly contiguous along the median line. Dististyle with about the basal two-fifths much stouter than the narrowed distal portion, on the mesal face at the point of narrowing with a conspicuous flattened ear-shaped blade; mesal face of style beyond this blade densely set with dark setae that are longer and more conspicuous than usual in this genus, these becoming small and finally obsolete at apex; these setae surround the base of the ear-like lobe for a short distance basad of its origin. Gonapophyses forming elongate acicular blades.

Hab. British Columbia.

Holotype, ♂, Marysville, altitude 5500 feet, May 11, 1919 (*C. B. D. Garrett*); *Alexander* Coll.

Paratypes, ♂, Lillooet, May 3, 1916 (*Tom Wilson*); Can. Nat. Coll.; 5 ♂♂, Cranbrook, April 5, May 5, October 21, November 9, (*C. B. D. Garrett*).

The type of this very interesting fly was kindly given me some years ago by Mr. Garrett, after whom the species is named.

Trichocera salmani, sp. n.

Male.—Length about 4 mm.; wing, 5.2 mm.

Rostrum and palpi brownish black. Antennae brownish black throughout. Head dark brown.

Mesonotal praescutum dark grayish brown, without evident stripes or other markings, the remainder of the notum grayish brown. Pleura dark grayish brown. Halteres elongate, obscure testaceous, the knobs darkened. Legs with the coxae dark brown; trochanters dark; remainder of legs dark brown, the femoral bases only vaguely paler. Wings grayish subhyaline, only the oval stigma darker, pale brown; veins brownish black. Macrotrichiae of wing relatively short and sparse; none on basal half of *Sc*, on the distal half or a little less weakly present; *Sc*₁ similar, with the basal half virtually devoid of trichiae; none on 2nd *A*. Venation: *R*₂₊₃ about three times basal section of *R*₂ and about three-fourths as long as *R*₂₊₃₊₄; *R*₁₊₂ a little more than one-half the second section of *R*₁; cell *M*₁ about one-half longer than its petiole; *m-cu* at the fork of *M*₃₊₄; vein 2nd *A* very small.

Abdomen uniformly dark brown. Male hypopygium of very remarkable form. Tergite deeply emarginate, each lobe with a dense brush or stout pencil of reddish bristles that greatly exceed the lobes in length. Basistyles relatively small, apparently without mesal lobes. Dististyle greatly elongated, bifid, the basal portion stout, the long outer arm sinuous, a little expanded at tip, the apex with a group of conspicuous erect setae on inner face and a series of about eight longer setae arranged in a linear row down the distal third of the outer face; inner arm of dististyle, which represents the usual basal tubercle, produced into a long slender arm, the tip weakly expanded. Gonapophyses very elongate, gently curved.

Hab. Massachusetts.

Holotype, ♂, In laboratory, Fernald Hall, Amherst, January 22, 1927 (*K. A. Salman*); *Alexander* Coll.

This is quite the most remarkable species of *Trichocera* so far made known. It is named in honor of the collector, to whom I am indebted for numerous American and Salvadorean Tipulidae. The unique type was taken in the laboratory of Fernald Hall, during a mild spell of weather. Careful search out-of-doors within a