

NOTES ON EASTERN NEARCTIC *HAEMATOPOTA*,
MERYCOMYIA, AND *CHRYSOPS*, AND DESCRIPTION
OF MALE OF *C. ZINZALUS*
(DIPTERA: TABANIDAE)^{1,2}

CORNELIUS B. PHILIP,³ HOWARD V. WEEMS, JR.,⁴
AND G. B. FAIRCHILD⁵

ABSTRACT

New distributional records are given for *Haematopota rara* Johns. (Ohio, Nova Scotia); *H. punctulata* Macq. (Liberty Co., Fla.); *Chrysops* (*Liochrysops*) *hyalinus* Shann. (N. Carolina; Franklin Co., Fla.); *C. zinzalus* Philip (Me., N. H., Nova Scotia); *C. abatus* Phil. (Franklin and Jackson Counties, Fla.); *Microtabanus pygmaeus* (Will.) (Santa Rosa, Baker, and Putnam Cos., Fla.). The male of *C. zinzalus* is described, and notes on habitats of other species are given. The larvae of *Merycomyia whitneyi* were found to be sold as fish bait in northern Florida. A key to both sexes of the *Chrysops frigida* group is given.

We report here new records, extensions of range, and other information indicating that a number of eastern Nearctic Tabanidae heretofore considered rare, are relatively abundant when their preferred habitats or times of flight are discovered. Some of this new information is the result of the use of Malaise-type flight traps; the rest is due to the luck of being in the right place at the right time.

Philip (1953) reviewed the 3 known species of North American *Haematopota* (= *Chrysozona*) in relation to 2 additional ones that were previously undescribed, and he reiterated the rarity of the eastern representatives. Of these, the male of only the northern and western *H. americana* Osten Sacken had been described, until Pechuman (1955) described the male of *H. rara*, and Jones and Anthony (1964) described the male of *H. punctulata* Macquart. Less than a dozen specimens of either northeastern *H. rara* Johnson or Floridian *H. punctulata* had been available for study. Now a spectacular series of both species has been received, including males which were taken in Malaise-type traps in 1968, 1970, and 1971 (to be reported below). *H. champlaini* (Philip) in the eastern U. S. and *H. willistoni* (Philip) in California thus remain the only rare species for which males are still unknown. Recent popularity of trapping could change this.

The genus is most elaborated in the Old World; in the New, no species is known south of the Mexican border. This distribution suggests that colonization of the Nearctic Region occurred relatively recently from boreal progenitors in the Eastern Hemisphere.

¹Contribution No. 264, Bureau of Entomology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville, Florida 32601.

²Florida Agricultural Experiment Stations Journal Series No. 4976.

³Research Associate, Department of Entomology, California Academy of Sciences, San Francisco 94118.

⁴Bureau of Entomology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville 32601.

⁵Dept. Entomology and Nematology, University of Florida, Gainesville, Florida 32601; Research Associate, Florida State Collection of Arthropods.

Haematopota rara Johnson. All previous records, including those of Stone (1938), are for mid-June to early July. In the present series, 4 males and 36 females were taken in a flight trap at Cedar Swamp, Champaign Co., Ohio, 26 June–5 July 1968, by R. E. Woodruff. This is considerably west of the few previous records for Pennsylvania (Rutherford and York Springs—2 males by S. W. Frost, which were associated by Philip in 1953, on basis of appendages but not otherwise described) and Virginia (Arlington—2 females taken at light, 28 June, by J. G. Franclemont), as well as others in New Jersey. A further short series consisting of 1 male, 8 females, was taken in Cape Breton Island, Nova Scotia, by Fairchild (1 female, Beinn Breagh, Baddeck, Victoria Co., 11-12 Aug. 1971, flight trap; 1 male, 7 females, Baddeck, Victoria Co., 1-14 Aug. 1972, flight trap in spruce-sphagnum bog); these records show that farther north the flight season occurs nearly a month later. These specimens are slightly darker and more contrasting than the type in M. C. Z., perhaps due to the age of the latter. They are like the Ohio specimens, but the light wing markings are slightly broader, especially those at apices of cells along the posterior wing margin. This collection represents a great extension of range, nearly 1,500 miles, and suggests that the species may be northern with a preference for bog habitats and that it has been overlooked because of its obscure and non-aggressive habits.

The 8.5 mm male described from Virginia by Pechuman is larger than the Ohio males, though the single male from Nova Scotia measures 9 mm.

Haematopota punctulata Macquart. Three males and 18 females were taken in a flight trap, by H. V. Weems, Jr., at Torreya State Park, Liberty Co., Florida, 9-17 May 1968, and 1 male and 8 females were taken in a flight trap at the same locality between 30 April and 5 May 1973 by Weems and C. R. Artaud. Two males were taken at light in Jacksonville, 26 May 1960, by W. J. Platt, III. At least 2 earlier females were labeled from Jacksonville by Mrs. A. T. Slosson without other data, and one of these in C.B.P. Coll. agreed with fragments of the type, including a wing, in the Paris Museum. Though this type was listed from "Carolinie" without other data, the locality could have included Florida at the early date of the original description.

Females in the Torreya State Park series measure 5.5 to 7 mm but otherwise have little significant variation. The subapical notch on the scape is occasionally indicated only by a depression. Males in the Torreya State Park collection are smaller (5 mm) than the male (7.0 mm) described by Jones and Anthony. These authors reared their single male; no adults were collected.

The key characters provided in 1953 may be used for separation of both sexes. The bare, black lateral extensions of the frontal triangle on either side of the black spot in the males of *H. punctulata* furnish a useful supplemental character.

Chrysops hyalinus Shannon. Prior to the "rediscovery" of this peculiar species in northern Florida (Philip and Jones 1962) and southern Alabama (Philip and Weems 1966), the fear had been expressed that the species had been "extinguished" by destruction of its originally-discovered habitats in the Beltsville, Md., bogs. There was only 1 intervening record—2 females captured by A. H. Manee at Southern Pines, North Carolina, 14 May 1909. It came as a welcome ecological surprise, therefore, to discover a female among flies sent to Paul H. Arnaud, Jr. (CAS) which were taken in a flight trap by J. D. Birehim at Fort Bragg, Cumberland Co., N. C., 28 May–3 June 1967. Weems and C. F. Zeiger collected 4 males and 6 females from flowers and foliage of wild cherry,

Prunus serotina Ehrhart at Glen St. Mary, Fla., 3 April 1964. Subsequently Weems and Fairchild took a short series of *hyalinus* at Wright Lake, Apalachicola National Forest, Franklin Co., Fla., 19-21 April 1971. Specimens flying about the collectors were netted. Also, M. A. Tidwell took specimens at Gales Creek, Carteret Co., N. C., 22-26 May 1971. So the species evidently has an extensive range in the southeast in suitable habitats, apparently flying in early spring.

C. hyalinus was put in a unique subgenus, *Liochrysops* Philip, because of its peculiar habits and morphology; the genitalial characters of both sexes recently figured by Philip and Coscaron (1971) are not unusual for the genus, and the habits seem not as unusual as at first thought.

Chrysops zinzalus Philip. Since it was described from a single female from New Brunswick over 30 years ago (Philip 1942), this species has been reported rarely in the literature, and the male remains undescribed. Pechuman (1972) reported 16 specimens from New Brunswick, Nova Scotia, Maine, Vermont, and New York. Philip recently studied a specimen from Saddleback, Maine that is preserved in the Hine collection at Ohio State University. During the summers of 1971 and 1972, Fairchild collected a short series, including males, in flight traps at 3 localities on Cape Breton Island, Nova Scotia. We also have been informed by L. L. Pechuman that he and H. J. Teskey obtained numerous females in CO₂-baited traps in northern New Hampshire during 1972. Some of Fairchild's specimens have been distributed to colleagues, but data on these duplicate the following: 1 female, Beinn Bhreagh, Baddeck, Victoria Co., N. S., 7 July 1971; 1 female, Fishing Cove Mt., Inverness Co., N. S., 17 July 1971, in bog; 2 males, 3 females, Baddeck, Victoria Co., N. S., 8-11 July 1972, flight trap in bog. The first specimen listed was taken in an old clearing in a mixed spruce-hardwood forest that has small scattered low spots covered with sphagnum, grasses, and ferns. The remainder were all taken in typical sphagnum bogs with scattered, stunted spruce.

Male. Length 9 mm. Eyes bare, contiguous for only a short distance below the large black shiny ocelligerous tubercle; area of enlarged facets not over 1/3 eye area, forming an ill-defined triangular patch in center of eye. Frontal triangle between eyes black, shiny; the subcallus grey pollinose. Frontoclypeus and genae black and shiny except for a mid-facial stripe reaching from antennal bases 2/3 distance to proboscis; broad bands between tentorial pits and genae, from eye margin nearly to base of proboscis and post ocular area, are yellowish-grey pollinose. Palpi black, subshiny, decumbent, shorter and stouter than in female, with an ill-defined patch of yellowish pollinosity on the outer anterior surface. Antennae entirely black, thinly grey pollinose; the scape somewhat inflated, slightly longer than more slender pedicel; the third segment longer than either of 2 preceding but slightly less than their sum. Basal consolidated portion of third segment slender, longer than 4-anulate style.

Mesonotum blackish subshiny, with a broad median and narrower lateral stripes of paler and denser pollinosity; the notopleural lobes paler but dark-haired. Dorsum sparsely, sides and scutellum more densely, beset with long yellowish hairs. Pleura and sternum greyish pollinose, densely yellow-haired. Legs black, except for extreme bases of fore tibiae, basal halves of mid tibiae, and mid and hind basitarsi, which are dull dark reddish. Legs mostly short black-haired, except for fore coxae and posterior aspect of mid and hind femora which bear sparse, long yellowish hairs. Wings as in female, except first

basal cell about 3/4 and second about 2/3 infuscated; anal area darker.

Ground color of abdomen above with first segment black on middle half, the lateral fourths yellow. Second segment yellow with a central black patch as wide as the black area on segment one at fore border, narrowing posteriorly, with its hind margin not reaching hind border of the segment, and with a broad notch in its hind margin. There is also a prominent black oval spot on extreme sides of second segment. Third and fourth segments largely black, with broadly W-shaped yellow hind margins which extend the yellow nearly to anterior margins of the segments at extreme sides. Fifth segment similar, but yellow margin and median triangle barely evident in integument. Remaining segments black. The yellow areas are pale pollinose, the pollinosity on third to fifth segments more extensive than the underlying color, serving to accentuate the basic pattern. Black portions thinly dark pollinose. The venter of the first segment is yellow with a central, square black patch; the second, yellow with a small black median triangle; the remaining segments black with broad yellow hind marginal bands. Hairs are sparse, their colors following the underlying colors.

Description based on a specimen taken 10-11 July 1972, at Baddeck, Victoria Co., N. S., in flight traps set in bog on Trans Canada Highway back of the town. Another specimen, same locality and date, is smaller (7.5 mm), with the black patch on first and second tergites more strongly narrowed behind and nearly reaching hind border of second segment. The black oval spots on second segment laterally are smaller, paler, and fainter.

The extension of the black crossband along third vein is variable, but in none of our specimens does it reach the fork. The only male of *nigripes* we have seen differs in having the abdomen and legs entirely black and the facial pollinosity more extensive; the mid-facial pollinose stripe reaches base of proboscis. Below is a key for separating both sexes of *frigidus*, *nigripes*, *zinzalus*, and *venus*.

KEY TO *Chrysops frigida* GROUP

FEMALES

1. Hyaline crescent does not include fork of R₄, so that only rarely is there a small hyaline spot in first submarginal cell (third R). Abdomen without clear, pale-pollinose median triangles on second segment, though occasionally such triangles are weakly indicated on third and succeeding segments. Legs yellow or black 2
- 1'. Hyaline crescent extends into first submarginal cell, either broadly or as a large isolated spot separated by a dark spur from crossband to fork. Second and succeeding tergites with generally prominent mid-dorsal pale-pollinose triangles. Legs almost entirely black 3
2. Mid and hind tibiae predominantly yellow, femora usually yellow, occasionally brown to blackish. Crossband rarely reaching hind margin, and then only as a spur along vein Cu₁ *frigidus* O. S.
- 2'. Legs entirely black; at most mid tibiae reddish at base. Crossband generally reaches hind margin in fourth and fifth posterior cells, though in dilute intensity *venus* Phil.

3. Frontal callus bar-like, markedly wider than high. Apical spot narrower, not or hardly wider than marginal cell and not or barely entering second submarginal cell (4th R). Crossband with a strong spur along R_{4+5} which reaches or approaches fork *nigripes* Zett.
- 3'. Frontal callus broadly heart-shaped, hardly wider than high, highest in middle. Apical spot broader, diffuse posteriorly, clearly entering second submarginal cell. Crossband with or without a weak spur which does not nearly reach fork *zinzalus* Phil.

MALES

1. Legs, at least mid and hind tibiae, extensively yellow. Apical spot filling more than half second submarginal cell; hyaline triangle not extending into first submarginal cell. Abdomen dark yellow with a series of black mid-dorsal spots on tergites 2 to 4 *frigidus*
- 1'. Legs black, at most with bases of mid tibiae reddish 2
2. Wing as in *frigidus*, though outer margin of crossband nearly even. Abdomen with tergites 3 to 6 black, with broad yellow hind margins *venus*
- 2'. Apical spot less extensive; hyaline triangle entering first submarginal cell. Abdomen with yellow at most only on sides of tergites 2 to 4 3
3. Abdomen black above and below, with but small, round, yellow spots laterally on tergite 2, and faint pollinose mid-dorsal triangles on tergites 2 to 6. Wings as in female, but second basal cell over 1/2 infuscated *nigripes*
- 3'. Abdomen broadly yellow on sides of tergite 2, and yellow present though reduced on sides of tergites 3 and 4. Second sternite yellow with a small median black spot. Pollinose median triangles and wing pattern as in female, except basal cells more extensively dark *zinzalus*

Chrysops abatus Philip. This is proving to be another early spring species with considerable range in the southeast. Described by Philip (1941) from a single female from Jacksonville, Fla., June, it was later reported from Orlando, Fla. and Gulfport, Miss. by Philip (1952) and from Liberty Co., Fla. by Philip and Weems (1966). All records except the type were in April. Jones and Anthony (1964) mentioned South Carolina, but took no specimens in Florida. Tidwell (1973) found the species abundant in coastal pine forests in Mississippi and in similar habitats in Louisiana in April and May. Weems and Fairchild netted a short series of females at Wright Lake, Apalachicola National Forest, Franklin Co., Fla. 19 Apr. 1971, while another short series was taken in a flight trap at Florida Caverns State Park, Jackson Co., 22-23 Apr. 1972, by H. N. Greenbaum. This species is very similar to *C. dorsovittatus* Hine in wing and abdominal pattern. The extent of the pollinose facial stripe as a key character to separate the 2 species, used by Jones and Anthony (1964), is unreliable. Tidwell (1973) used the color of fore coxae—yellow in *dorsovittatus*, black in *abatus*—as the main key character, and this has worked well. The main

characters separating the 2 species are contrasted below. We took *dorsovittatus* at Wright Lake with *abatus*. Fairchild (1937) reported *dorsovittatus* in Jefferson Co., Fla., in April, and May; although some of these may have been *abatus*—they are not presently available—the 2 species appear to fly together and may be “sibling” species. Weems and C. R. Artaud took more than 100 females of *dorsovittatus* in a flight trap at Torreya State Park, Liberty Co., between 30 April and 5 May 1973, but they took no specimens of *abatus*.

Fore coxae bright yellow. Mesonotal and pleural stripes bright, contrasting, the pleura yellow pollinose. First basal cell wholly black, abdominal midstripe nearly always complete *dorsovittatus*

Fore coxae black or partly dull yellow. Mesonotal and pleural stripes dull, less contrasting, the pleura gray pollinose. First basal cell with an apical hyaline spot. Abdominal midstripe usually broken by pale, posterior segmental bands which often form small median yellow triangles *abata*

Microtabanus pygmaeus (Williston). Although widely distributed (New York to Florida), this species, the smallest Nearctic tabanine, is seldom represented by more than a single specimen in collections. On 24 May 1971, Weems and Fairchild collected approximately 100 specimens of both sexes on Navarre Beach, Santa Rosa Co., Fla. This is essentially a partially stabilized, sand-dune barrier island fronting the Gulf of Mexico between Pensacola and Panama City. The flies were taken by sweeping an area of low vegetation which included *Drosera* sp. (sundew), club mosses, grasses, and herbs not over 12 in. high. The vegetation was growing in a low damp swale, surrounded by semi-active sand dunes 100 m or less from the Gulf coast of the island. A strong breeze was blowing, and the insects were relatively inactive, but occasionally they were seen resting on vegetation and making short flights. No other tabanids, and only a few other insects appeared to share the habitat. Also, we saw 1 male, 1 female (Long Lake, Putnam Co., Fla., 20-25 May and July 1971) and 2 males (Olustee, Baker Co., Fla., Sept. 1966). Both collections were taken in ultra-violet light traps. The eye of the live female is bi-colored—the upper half light grey, the lower half greenish black. The male eye has the enlarged upper facets pale grey, the lower facets greenish black. Weems, on a visit to the Navarre Beach locality in August 1972, failed to find this species, although our and other records suggest it has a long flight season. Possible sources of blood meals at the Navarre Beach locality would seem to be few, mainly nocturnal mice, whose tracks and burrows were evident in the area, or birds. The taking of specimens of both sexes in light traps in Florida also suggests that *M. pygmaeus* may be a nocturnal feeder.

Merycomyia whitneyi (Johnson). This widely distributed species is considered to be one of the rarer North American Tabanidae. Pechuman (1964) reviewed the genus and was able to find authentic records of only 20 specimens, and only once was more than 1 specimen taken at a single locality. The range is extensive, from Ontario to Maine, south to central and western Florida. Adults have been reared on several occasions, and the larva and pupa described by Teskey (1969). Hays and Tidwell (1967) reared a specimen in Alabama from a larva taken from a pond bottom, under 75 cm of water, and fed on housefly larvae in the laboratory. Jones and Anthony (1964) recorded that larvae of the only other species of the genus, *M. brunnea* Stone, were also

taken under as much as 2 ft of water in shallow ponds with much emergent vegetation.

In early 1971, Fairchild was shown a series of both sexes of *M. whitneyi* by J. F. Butler of the University of Florida. The previous spring, one of Butler's students had purchased a large number of larvae in a small country store near Tallahassee, Florida. Butler recognized them as tabanid larvae and successfully reared about a dozen adults. In February 1971, Fairchild investigated further, purchased more larvae from the same country store, and reared some more adults which emerged in late April and early May. These larvae apparently are well known in northern Florida as "sandworms," and are much esteemed as bass bait. Fairchild paid 13¢ apiece for several "sandworms." The larvae are collected by vigorously raking the bottoms of sandy-bottomed ponds containing emergent vegetation in 2 to 3 ft of water. The larvae float to the surface and are taken by hand. Fishermen value these larvae as fish bait because these larvae are physically tough—more than one fish may be taken on a single "sandworm." They do not attack each other, so that several can be carried together in a container, and they do not bite the fisherman, as large *Tabanus* larvae are inclined to do.

A single male of *M. whitneyi* was collected at a window, Gainesville, Fla., 3 June 1973, by Robin Esser.

LITERATURE CITED

- Fairchild, G. B. 1937. A preliminary list of the Tabanidae of Florida. Fla. Ent. 19:58-63; 20(1):10-11.
- Hays, K. L., and M. A. Tidwell. 1967. The larval habits of some Tabanidae from Alabama and northwest Florida. J. Ala. Acad. Sci. 38:197-202.
- Jones, C. M., and D. W. Anthony. 1964. The Tabanidae of Florida. USDA Agr. Res. Serv. Tech. Bull. 1295, 85 p.
- Pechuman, L. L. 1955. Some undescribed or little known males of Tabanidae. Bull. Brooklyn Ent. Soc. 50(3):57-59.
- Pechuman, L. L. 1964. A synopsis of *Merycomyia* (Dipt. Tabanidae). Proc. Ent. Soc. Ont. 94:62-67.
- Philip, C. B. 1941. Notes on Nearctic Pangoniinae (Dipt. Tabanidae). Proc. Ent. Soc. Wash. 43(6):113-130.
- Philip, C. B. 1952. Notes on tabanid flies and other victims caught by the carnivorous plant, *Sarracenia flava*. Fla. Ent. 35:151-155.
- Philip, C. B. 1953. The genus *Chrysozona* Meigen in North America. Proc. Ent. Soc. Wash. 55:247-251.
- Philip, C. B. 1971. New records of North American Tabanidae (Diptera). 1. Species new to the faunas of Mexico or the United States. Pan-Pac. Ent. 47:284-287.
- Philip, C. B., and S. Coscaron. 1971. Comparative terminalia of certain Nearctic and Palearctic Chrysopsine flies. Ann. Ent. Soc. Amer. 64:157-162.

Philip, C. B., and C. M. Jones. 1962. New North American Tabanidae. XV. Additions to records of *Chrysops* in Florida. Fla. Ent. 45:67-69.

Philip, C. B., and H. V. Weems, Jr. 1966. Rediscovery of *Chrysops* (*Liochrysops*) *hyalinus* and new records for *C. abatus*. Fla. Ent. 49:115-117.

Stone, A. 1938. The horseflies of the subfamily Tabaninae of the Nearctic Region. U. S. Dep. Agr., Misc. Pub. No. 305, 171 p.

Teskey, H. J. 1969. Larvae and pupae of some eastern North American Tabanidae. Mem. Ent. Soc. Can. 63:1-147.

Tidwell, M. A. 1973. The Tabanidae of Louisiana. Tulane Studies in Zoology and Botany 18(1-2):1-95.

The Florida Entomologist 56(4) 1973

FISHING WITH NATURAL INSECTS

A limited number of copies of Fishing with Natural Insects by Alvah Peterson are still available. Price \$6.00 each. Send order to The Florida Entomological Society, P. O. Box 12425, University Station, Gainesville, Florida 32601.