

A NEW SPECIES OF CULICOIDES FROM FLORIDA WITH  
ADDITIONAL DISTRIBUTION DATA FOR THE GENUS  
(DIPTERA: HELEIDAE)

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In the course of examining mosquito light trap material at the Florida State Board of Health, Bureau of Entomology, a new species of *Culicoides* has been found and four other species taken which are new records for the State. Type specimens of the new species are deposited in the United States National Museum in Washington, D. C., and paratypes are in the University of Florida Collection, Gainesville.

*Culicoides venustus* Hoffman:—This species has now been found in eleven Florida counties across the northern part of the State from Escambia to Clay and south to Alachua County. In Jackson and Madison Counties some specimens have only one light spot in the tip of cell  $M_1$  (others have a faint second spot), but all other characters, including the spines on the hind tibiae are typical of *venustus*. Tibial spines are an excellent character for separating *venustus* from *inamollae* where any doubt exists, as there are five spines on the hind tibiae of *venustus* and six on *inamollae*.

*Culicoides inamollae* Fox and Hoffman:—In a previous paper (1952) the writer accepted Lane's (1950) synonymy of *inamollae* as *guttatus*, but an opportunity to examine further specimens of *guttatus*, and the apparent confusion of the status of *inamollae* in the literature, has led the author to believe it wisest to retain the name *inamollae* for Florida specimens until such time as the taxonomy is straightened out. There appears to be no question but that Florida's specimens are the same as specimens from the type locality of *inamollae*, so whatever the taxonomic status of that species becomes, Florida specimens will be the same. This species has been recorded from thirty-five counties throughout Florida. *C. inamollae* and *C. venustus* have been taken from the same light traps in several northwestern counties in the State.

*Culicoides obsoletus* (Meigen):—Reported formerly only on the basis of a single female specimen from Marion County, this species has now been taken in Lake, Highlands, and Alachua Counties. A single male was captured in Alachua County.

*Culicoides canithorax* Hoffman.—This species was previously reported as occurring both on the coast and inland. It is now evident that the specimens recorded from inland counties were not this species. *C. canithorax* has been taken in twenty-four counties, all coastal.

*Culicoides biguttatus* (Coquillett):—This species has been found in two new counties, Jackson and Baker. A number of males have been taken. The species was found to be most abundant during April and May in 1954.

*Culicoides travisi* Vargas:—Records for the State were formerly based on female specimens. Males have now been taken and the species found in north and central Florida counties.

*Culicoides nanus* Root and Hoffman:—This species has been taken in Escambia, Alachua, and Flagler Counties. In all counties males were taken.

*Culicoides niger* Root and Hoffman:—Previously recorded only from Citrus and Walton Counties in Florida, it has now been taken in light traps in sixteen counties as far south as Highlands County. The period in which it is abundant is apparently short; most specimens taken in light traps occurred in February and March, both in 1954 and 1955. Males are common in light trap collections.

*Culicoides haematopotus* Malloch:—This species has been taken in thirty-six counties, coastal and inland, from northwest Florida to the southern tip of the State. It is one of our most widely distributed species.

*Culicoides spinosus* Root and Hoffman:—This species has been identified from Escambia and Volusia Counties on the basis of male genitalia. It undoubtedly occurs in many other counties, but females are difficult to separate from similar species.

*Culicoides piliferus* Root and Hoffman:—This species, originally reported as occurring only in Escambia County in Florida, has proved to be rather widespread in the State, and in some localities very abundant. It is recorded from seven counties as far south as Highland County. Most county records are based on the identification of male genitalia.

*Culicoides loughnani* Edwards:—All previous Florida records were from the extreme southwestern coast. Four new county records: Levy, Flagler, St. Lucie and Duval, extend the known range northward on the western coast, and represent the first records on the east coast. It should be remarked, however, that only occasional specimens have been found in these northern counties, and all specimens from there have been females.

*Culicoides floridensis* Beck:—Originally described from Sarasota County, Florida, this species has now been found in Volusia, Marion, Broward, and Highlands Counties. It apparently is most abundant in midsummer.

The following species have not previously been recorded from Florida:

*Culicoides variipennis* (Coquillet):—This species has been taken in Walton and Jackson Counties. Apparently the western section of Florida represents the extreme southern limits of the range of this species in the Eastern United States.

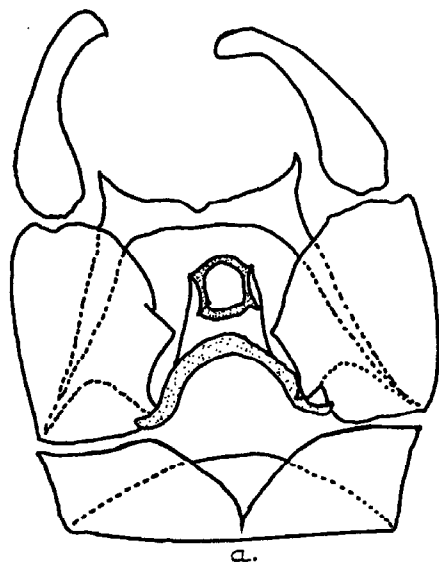
*Culicoides ousairani* Khalaf:—This species, described from Oklahoma, (1952), has been found in light traps in Escambia, Taylor, Jackson, Alachua and Volusia Counties. Males taken in these traps were compared by Dr. W. W. Wirth with specimens in the National Museum and found to agree.

*Culicoides pusillus* Lutz:—Specimens have been taken in Volusia, Alachua, Marion and Okeechobee Counties. A comparison of male genitalia with specimens which Dr. Irving Fox kindly sent from Puerto Rico, established that the Florida specimens were *C. pusillus*.

There are no new distribution data of interest for the following species occurring in Florida: *C. arboricola* Root and Hoffman, *C. villosipennis* Root and Hoffman, *C. crepuscularis* Malloch, *C. melleus* (Coquillet), *C. furens* (Poey), *C. stellifer* (Coquillet), and *C. baueri* Hoffman.

*Culicoides bermudensis* Williams:—This species recently described from Bermuda (1956) has been taken in a light trap at Santa Rosa in Walton

County, Florida, during July and August in 1955. As the male has not been described, a description of the male genitalia follows.



CULICOIDES BERMUDENSIS-Williams

a. Ventral view of male genitalia - parameres omitted.

b. Parameres

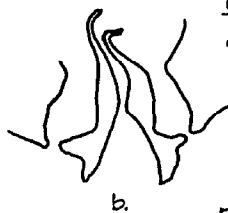


FIGURE -1.

**MALE GENITALIA** (Figure 1): Apicolateral processes of the ninth tergite well-developed; posterior margin of the ninth tergite with a rather broad rounded notch; ninth sternite with a broad V-shaped notch dividing the sternite almost to its base, the membrane of the ninth sternite spiculate; basistyle stout, dorsal root rather short and blunt, ventral root lacking. Aedeagus consists of a low wide arch with a broad tip having a curved, well-chitinized apex. Parameres with heavy footed bases, tips tapering to a narrow point.

The females of this species taken in Florida differ in several respects from the specimens taken in Bermuda. In general, Florida specimens are more grayish and darker with less distinct wing spots, while the Bermuda specimens are lighter, more yellowish, with more distinct wing spots. Bermuda specimens have an apical light spot in cell R<sub>5</sub>; no such spot occurs in Florida specimens. Also the radial cells of Florida specimens are entirely dark and more closed, while the radial cells of Bermuda specimens are more open and there appears to be a light spot cutting across the tip of the 2nd radial cell. As there is a general agreement in other characters, it is probable that the Florida form represents, at most, a subspecies, and much wider collecting would be necessary before that status could be assumed.

*Culicoides knowltoni*, n. sp.

FEMALE: Length 1.8 mm.; wing 1.3 by 0.65 mm.

Head and appendages dark brown, except antennae lighter; eyes bare, well separated with hair socket between. Antennae with flagellar segments in proportion of 18:12:12:12:12:12:14:14:30:32:36:38:46, antennal ratio thus 1.6. Distal sensory tufts on segments 3 - 14, inclusive. Palpal segments in proportion of 8:15:18 x 8:7:7, third segment swollen just beyond middle with broad fairly shallow pit containing many spoon-shaped sensillae.

Mesonotum light brown prunescent; darker brown on humeri, indistinctly along a narrow median line, a small spot posterior to sensory pits, and in prescutellar depression, the hairs light yellowish. Scutellum dark brown with four long brown bristles. Postscutellum and pleuron dark brown. Legs light brown with very dark knees; hind tibial comb of four long brownish bristles.

Wing with radial cells complete, costa .6 as long as wing. Macrotrichia dense over entire wing. Wing background gray with numerous more or less confluent light spots. Four light areas along costa, one across wing base confluent with large light area in base of anal cell; one from costa, over r-m crossvein into base of cell M to cubital vein; one just beyond and under 2nd radial cell; and one in cell  $R_5$  about halfway between 2nd radial cell and wing apex. Aside from light area at base cell  $M_1$  has two light spots, not open to wing margins. Cell  $M_2$  also has two light spots. Cell  $Cu_1$  has one light spot open to wing margin. Anal cell is light at base and has an hourglass-shaped spot close to vein  $Cu_2$ . In some specimens these spots tend to be largely confluent. This wing pattern differs from that of *crepuscularis* only in the light area under the 2nd radial cell. Halteres white.

Abdomen dull light brown; spermatheca (Figure 2c) single, dark, elliptical, at least four times as long as wide, the duct not chitinized, but with short fork at the posterior fourth, no apparent ring or rudimentary spermatheca.

MALE GENITALIA (Figure 2a, 2b): Ninth sternum with broad shallow excavation, the posterior membrane spiculate; ninth tergum only slightly tapered, with well developed apicolateral processes, the posterior margin between them with a deep notch, and minute serrations between the notch and apicolateral processes. Basistyles broad, the dorsal root short and almost truncate, the ventral root lacking; dististyles tapering and slightly curved inward. Aedeagus consisting of a broad heavily chitinized, footed arch, the tip broadly rounded and only lightly chitinized. Parameres very heavy footed and tapering to long, slender, curved pointed tips.

I take pleasure in naming this species for Dr. George F. Knowlton, Extension Entomologist, Utah State Agricultural College.

*C. knowltoni* is very close to *crepuscularis*. Females are separated from *crepuscularis* by the distinctive spermatheca and by the presence of a continuous light area beyond and under the 2nd radial cell. However, this light area is sometimes also present in *crepuscularis*. The male genitalia has broader basistyles, the aedeagus heavier with broader more truncate tip, and irregular serrations between the apicolateral processes and the notch on ninth tergum. *C. knowltoni* has been collected in twelve counties,

inland and coastal, throughout peninsular Florida. It has been taken throughout the year, but one light trap checked weekly indicates that it is predominant March through May. Specimens apparently of this species have been previously recorded from Florida by Foote and Pratt (1954) and Beck (1952).

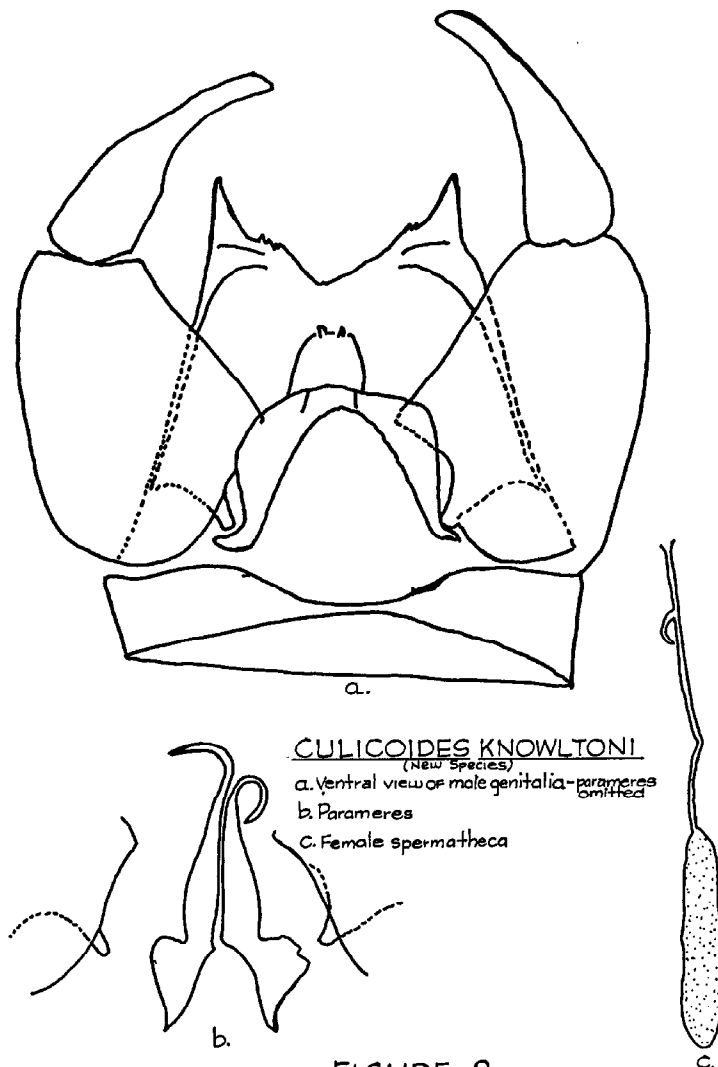


FIGURE-2.

The five species which this paper adds to the previously known fauna of Florida brings the number of known species of *Culicoides* in Florida to a total of twenty-seven. This includes *Culicoides guttipennis* (Coquillett) recorded from Escambia County by Foote and Pratt (1954), and *Culicoides tricoloratus* Wirth recorded from Palm Beach County by Wirth (1953), species which have not yet been taken in State Board of Health light traps. Four of the twenty-seven species are probably of West Indian origin; *C. inamollae*, *C. pusillus*, *C. tricoloratus*, and *C. loughnani*, are thus far recorded only from Florida in the United States. *C. floridensis* and *C.*

*bermudensis* have been recorded only from Florida and Bermuda, suggesting possible endemicity. Twenty species are known throughout the eastern United States, although Florida apparently is the extreme southern limit of the ranges of some species such as *venustus*, *variipennis*, and *guttipennis*.

Appreciation is expressed to J. A. Mulrennan, Director of the Bureau of Entomology, Florida State Board of Health, for encouraging this study, to Chester Turknett, Bureau of Sanitary Engineering, Florida State Board of Health, for preparing the drawings, and to Dr. W. W. Wirth, United States National Museum, for aid in determining the taxonomy of the species and for reviewing the manuscript.

#### SUMMARY

A new species of *Culicoides* from Florida, *C. knowltoni*, is described and the male of *C. bermudensis* Williams is described. Florida distribution records on four species new for the State are given, together with new county records on previously recorded species. This brings the number of known species of *Culicoides* in Florida to twenty-seven.

#### LITERATURE CITED

- Beck, E. C. 1952. Notes on the distribution of *Culicoides* in Florida. Fla. Ent. 35(3): 101-107.
- Foote, R. H., and H. D. Pratt. 1954. The *Culicoides* of the eastern United States. Pub. Hlth. Monog. No. 18. U. S. Dept. Hlth., Educ., and Welfare. 53 pp.
- Lane, John. 1949. Sinonimias en *Culicoides guttatus* (Coquillet, 1904). Bol. Ent. Venezolana. 8: 115-117.
- Khalaf, K. T. 1952. The *Culicoides* of the Wichita Refuge, Oklahoma. Taxonomy and seasonal incidence. Ann. Ent. Soc. Am. 40(2): 348-358.
- Williams, R. W. 1956. The biting midges of the genus *Culicoides* found in the Bermuda Islands (Diptera, Heleidae) 1. A description of *C. bermudensis* n. sp. with a key to the local fauna. Jour. Parasit. 42(3): 297-300.
- Wirth, W. W., and F. S. Blanton. 1953. Studies in Panama *Culicoides* (Diptera: Heleidae) II. Descriptions of six additional species. Jour. Parasit. 39(3): 229-236.

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