

ADDITIONAL RECORDS OF HELEIDAE COLLECTED IN THE TENNESSEE VALLEY DURING 1956

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In a recent survey of Heleidae of the Tennessee Valley region, Snow *et al.* (1957) listed 50 known species and 11 undetermined species. Additional observations and collections made during 1956 after the original paper was submitted for publication form the subject of this report.

In June, 1956, Wirth and Jones published a short paper describing two new species of *Culicoides* based partly on TVA collections from Tennessee, but, since their work was not noted before the paper on Heleidae in the Tennessee Valley by Snow *et al.* (1957) was in press, it was not possible to include the two new species, *C. footei* W. & J. and *C. snowi* W. & J., as such in the text. However, collections of the species now known as *C. footei* are recorded by Snow *et al.* (1957) as *Culicoides* sp. 2. Collection records from Tennessee ultimately determined as *C. snowi* by Wirth and Jones were not included in the original survey by Snow *et al.* (1957).

We are indebted to Dr. W. W. Wirth and Dr. P. H. Arnaud, Entomology Research Branch, U. S. Department of Agriculture, for determination of species in the genera *Sphaeromias* and *Stilobezzia*, respectively.

As in the original survey, the following letter combinations have been used in the distribution records to indicate the method or conditions pertaining to the collection: BM (biting man); L [larva (e)]; P [adult (s) reared from pupa (e)]; JT (jar trap); and RT (rotary trap).

An annotated list of the heleids is presented below.

Culicoides arboricola R. & H.

ALABAMA: Town Creek, March 24 (L & P-4), June 8 (P-3), July 3 (P-1), August 7 (P-2); Waterloo, March 4 (L-2).

Overwintering larvae of *C. arboricola* were collected from a red oak cavity near Waterloo along with larvae of *C. guttipennis*, *C. nanus*, and *D. oppressa*. At Town Creek, larvae and pupae of *C. arboricola* were collected intermittently during the season from a wet sweet gum stump with *C. guttipennis* and a psychodid, *Brunettia nitida* (Banks).

Culicoides biguttatus (Coq.)

ALABAMA: Florence, May 4 (BM-1); Greenbrier, June 13 (BM-2). TENNESSEE: Dandridge, May 16 (BM-2).

Females of *C. biguttatus* were observed biting man during the daylight hours in forested bottoms.

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Culicoides guttipennis (Coq.)

ALABAMA: Town Creek, April 25 (P-4); Waterloo, March 4 (L-6). See *C. arboricola* for associations.

Culicoides haematopotus Mall.

One pupa of *C. haematopotus* was taken from sparse sedges (*Scirpus*) and lizardtail (*Saururus cernuus* L.) on the margin of Pickwick Reservoir.

Culicoides hinmani Khalaf

TENNESSEE: Bluff City, July 19 (P-1).

An adult of *C. hinmani* was reared from debris in a beech tree cavity near Bluff City with *Pachygaster pulcher* Lw. and *D. oppressa*.

Dr. Robert Jones has informed us that material previously collected in the Tennessee Valley region and designated as *Culicoides borinqueni* F. & H. (Snow, 1955; Snow *et al.*, 1957) should be referred to as *C. hinmani* Khalaf. Dr. Jones and Dr. Wirth are publishing a paper shortly to clarify the status and distribution of these two species.

Culicoides nanus R. & H.

ALABAMA: Waterloo, March 4 (L-1). MISSISSIPPI: Tishomingo, June 2 (P-2).

Larvae and pupae of this small heleid were taken from oak tree holes. The specimens from Tishomingo State Park were associated with *C. paraensis* and *D. oppressa* in the ooze at the base of a white oak.

Culicoides paraensis (Goeldi)

ALABAMA: Florence, September 9 (BM-6); Greenbrier, June 20 (BM-1). MISSISSIPPI: Tishomingo, June 2 (P-2).

Adult females were taken biting man during late afternoon hours along the margins of woods. Pupae of *C. paraensis* were found in wet woody debris in the base of a white oak tree near Tishomingo, Mississippi, with those of *C. nanus* and *D. oppressa*.

Culicoides piliferus R. & H.

TENNESSEE: Washington, April 20 (P-1).

A male pupa of *C. piliferus* was collected from a tuft of woolgrass [*Scirpus cyperinus* (L.)] along the grassy margin of Chickamauga Reservoir and was associated with *Sphaeromyias longipennis* Lw.

Culicoides snowi W. & J.

TENNESSEE: Sugar Tree, May 14 (JT-1).

A single female of this species reported as new by Wirth and Jones (1956) was taken with adults of *D. oppressa*, *B. nitida*, and several muscoid flies *Coenosia basalis* Stein from a tree cavity.

Culicoides stellifer (Coq.)

ALABAMA: Wright, June 29 (P-10).

Pupae of *C. stellifer* were abundant among clumps of sedge and lizardtail on the margin of Pickwick Reservoir and associated with *S. bulla* and *C. haematopotus*.

Culicoides travisi Vargas

ALABAMA: Greenbrier, June 13 (BM-1).

An adult female was collected biting man along the wooded margin of Beaverdam Swamp at dusk.

Culicoides variipennis (Coq.)

TENNESSEE: Charleston, September 7 (P-1)

One male pupa was collected in a seepage area overgrown with panic grass and associated with larvae of the mosquitoes *Anopheles punctipennis* (Say) and *Psorophora confinnis* (L.-A.)

Dasyhelea oppressa Thomsen

ALABAMA: Town Creek, March 24 (L & P-14), April 25 (P-3), May 12 (L-11), June 8 (P-1); Waterloo, March 4 (L-3). MISSISSIPPI: Tishomingo, June 2 (P-2). TENNESSEE: Bluff City, July 19 (P-1); Johnson City, July 19 (P-8); Sugar Tree, May 14 (JT-8); Maynardville, April 12 (L-3).

Adults of *D. oppressa* were reared from a stump hole; tree holes in red oak, white oak, and beech; and from exuding sap on the trunk of an elm tree.

Monohlelea stonei Wirth

ALABAMA: Greenbrier, June 11 (RT-1).

One female specimen was collected in a rotary trap operating in a pasture at the edge of Beaverdam Swamp during the dusk period. We have not previously found this genus or species in Alabama.

Sphaeromyias longipennis Lw.

TENNESSEE: Washington, April 20 (P-1).

A male of this species was reared from a clump of woolgrass on the margin of Chickamauga Reservoir with *C. piliferus*. It is our first record for this genus and species in the Tennessee Valley.

Stilobezzia bulla Thomsen

ALABAMA: Wright, June 29 (P-2).

Two pupae of *S. bulla* were found in clumps of sedges on the margin of Pickwick Reservoir with those of *C. stellifer*. This is our first record for this species in the Tennessee Valley.

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OBSERVATIONS ON BLACKFLIES (SIMULIIDAE) IN THE TENNESSEE RIVER BASIN

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A comprehensive survey of biting Diptera (Culicidae, Heleidae, Simuliidae, and Tabanidae) which originate in reservoirs of the Tennessee Valley Authority and in tributary portions of the Tennessee River Basin was undertaken in the years 1953-1955. Incidental observations were made in 1956. The objectives of this study of biting insects were to determine: (1) the species composition, distribution, seasonal activity, and economic importance, (2) the effects of the current water level schedules on production, and (3) the effects of the current larvicidal program and other measures (for the control of *Anopheles quadrimaculatus* mosquitoes) on the biting insect populations. This paper deals primarily with the ecology and distribution of the blackflies observed in the Tennessee River Basin during the course of this investigation.

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