

## A NEW SPECIES OF *CULISETA* (DIPTERA: CULICIDAE) FROM NORTH AMERICA<sup>1</sup>

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In identifying mosquitoes in Minnesota the author became aware that *Culiseta Corsitans* (Theobald) was being taken abundantly in light traps in the early spring. Since only overwintered mosquitoes were being taken at this time the appearance of *morsitans* seemed odd; this species is reported to overwinter in the larval and not in the adult stage. When these female mosquitoes were compared with specimens of *morsitans*, it was apparent that the females were of a different species. The author's wife Sylvia first separated the males of the two species. A description of the female follows:

### *Culiseta minnesotae* new species

Adult female. *Head*.—Antenna with about 15 segments including torus and ringlike proximal segment; somewhat longer than proboscis; torus light reddish brown with small dorso-medial patch of elongate, dark scales; flagellum dark with light pubescence and a whorl of a half dozen or so dark bristles at base of each segment; basal segment of flagellum with the whorl at middle and with an extra group of bristles proximally. Palps about a quarter the length of the proboscis, clothed with darkish brown scales, appearing somewhat paler at the tip. Proboscis about as long as tibia of fore leg, with dark scaling (about the color of that of the palps) but with a sprinkling of pale ones medially and particularly ventrally so that the proboscis is definitely lighter in the middle but lacks a distinct pale band. Vertex with dark, erect scales and narrow, silvery, appressed ones, the latter becoming more abundant on the sides of the head; there is a group of dark bristles bordering the eyes from one side of the head to the other, the bristles being more numerous dorsally between the eyes.

*Thorax*.—Mesonotum. Integument dark brown with a pair of lighter, reddish-brown stripes in the middle, the two stripes rather narrowly separated by a darker brown stripe. Vestiture of tiny, narrow, recumbent, coppery brown scales, and with lines of dark bristles anteriorly, laterally, and medially, which become much larger posteriorly. Somewhat posterior of the middle of the mesonotum and lying lateral of the two mesonotal lines are a pair of patches of silvery scales; posterior of each of these is a line of silvery scales extending to the antescutellar space. There are additional silvery scales in a patch between these two lines and on the sides of the posterior third of the mesonotum. Scutellum with many large, dark bristles, and a few narrow, pale scales. Anterior pronotal lobe with dark bristles and a few long, narrow, pale scales. Posterior pronotum with small, narrow, recumbent, dark scales, a few pale ones on the ventral margin and a row of dark bristles posteriorly. Propleuron with many bristles and clothed with pale scales. The sclerite ventral of the post-pronotum is bare except for a patch of pale

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scales posteriorly. Spiracular bristles present. Dorsal part of sternopleuron well bristled dorsally (pre-alars) and with a patch of bristles (upper sternopleurals) and pale scales ventrally. Ventral portion of sternopleuron with a patch of narrow, elongate, pale scales and a line of bristles (lower sternopleurals) posteriorly. Mesepimeron with a patch of pale scales medially and a patch of bristles in its upper part (upper mesepimerals), as well as a line of about three larger bristles (lower mesepimerals) anteriorly in the lower portion.

*Wing*.—Wing scales brownish for the most part; a few lighter ones on the basal half of the costa. The apical half or third of the costa has a fringe of distinctly pale or yellowish scales. There is a slight concentration of scales at the base of the third longitudinal vein ( $R_{4+5}$ ). Halteres brownish; knobs somewhat darker than the stems and densely clothed with pale scales.

*Legs*.—Coxa of fore leg well bristled and scaled, the scales being dark but becoming pale dorso-posteriorly. Coxae of mid and hind legs also with bristles and pale scales. Femora dark scaled above (or anteriorly) and pale scaled below (or posteriorly), with definite white knee spots; dark portions with a light sprinkling of pale scales. Tibiae with dark and pale scales, more in lines than being intermingled; in general with pale scales posteriorly and dark ones anteriorly but with a line of pale scales down the middle of the dark anterior portion. Tarsi in general dark-scaled but with lines of pale ones particularly on the posterior surface of the basitarsi, and with rings of pale scales basally on the segments as well as at the tips of the immediately preceding segments. These rings occur principally between the first and second, and the second and third segments of the tarsi, but one or two smaller ones may also be evident on the hind tarsi.

*Abdomen*.—Medial portions of the tergites with brown scales, basal and apical margins largely pale scaled. The pale scales are not white but are of a dingy yellowish or light brownish color. First tergite with apical medial patch of pale scales. Tergite of second segment with apical band of pale scales interrupted medially, and with scattered pale scales on the rest of the sclerite. Tergites of segments 3 to 7 with broad bands of pale scales basally and apically, tending to be interrupted on the median line, particularly on the apical band. The pale bands do not have distinct edges but rather grade into the darker, median, transverse portions of the tergites. Tergites of eighth segment extensively pale scaled. Venter of abdomen largely but unevenly pale scaled.

*Holotype*. Female taken May 4, 1953, by the author in a light trap near the greenhouse at Olcott Park, City of Virginia, St. Louis County, Minnesota (U. S. Natl. Mus. Type No. 62409).

The author has designated a series of 62 females as paratypes, 11 of which have been deposited in the U. S. National Museum under the same number as the holotype. The remainder are in the collection of the University of Minnesota and in the personal collection of the author. The paratypes are from Virginia, St. Louis Co., Minn.: Itasca State Park, Clearwater Co., Minn., and Hennepin Co. (Crystal Bay area), Minn. The dates on these specimens are April 19 and 28; May 4 to 7, 9, 10, 23 to 26, and 28; June 29; Sept. 13, 15, 17, 18; and October 1. Most, if not all, appear to have been taken in light traps.



and appear to be females which were either entering or leaving hibernation.

The female of *minnesotae* appears to be unique among North American *Culisetas* by virtue of the peculiar banding of the abdomen, the bands covering the apical portion of one segment and the basal portion of the next. Other interesting characters are the pale scales of the proboscis which are occasionally so conspicuous that the proboscis appears to be ringed; the pale markings of the mesonotum; the pale scaling on the anterior edge of the costa which is sometimes seen only on the outer part of the wing but often is found on the entire costa; the rather indefinite concentration of scales at the base of  $R_{4+5}$ ; and the pale tarsal bands which cover the apex of one segment and the base of the next. The clump of scales at the base of  $R_{4+5}$  is sometimes distinct but often not so. There occasionally appear to be similar aggregations at the base of the radial sector, at the branching of  $R_{2+3}$ , and at the branching of the medial vein, but these spots are even less distinct than the one at the base of  $R_{4+5}$ . These concentrations of scales should be further studied in perfect specimens. The two reddish brown mesonotal stripes of the holotype are usually evident only when the specimen is slightly rubbed.

All of the females of "*Culiseta morsitans*" from Minnesota in the University of Minnesota collection pertain to *minnesotae*, including a series identified by Owen (1937); there are no females of *morsitans* from Minnesota in the collection. It would appear that most previous records of *morsitans* from Minnesota pertain to *minnesotae*.

Thompson (1953) mentions a form resembling *morsitans* that he took in Nebraska (and has been taken in Boston). This form has apical but not basal bands on the tergites. In a letter to the author (June 1953) Thompson stated that it is not the same as the presently described species.

The description of *morsitans* females by Stage *et al.* (1952) pertains at least in part to *minnesotae* ("...Abdomen brown-scaled with scattered yellowish-white scales, most heavily concentrated along the apices and bases of segments, or these may occasionally form basal pale bands only..."). These authors illustrate the male genitalia of *minnesotae* under the name *morsitans*.

*Male*.—Males of both *minnesotae* and *morsitans* are commonly taken in light traps in Minnesota. The author can separate them only by the male terminalia. The terminalia of *morsitans* (illustrated on next page) are as figured from eastern specimens by many authors (e.g., Carpenter and LaCasse 1955). The terminalia of *minnesotae* (illustrated on next page) have been figured by Stage *et al.* (1952) from western specimens. It appears likely that *minnesotae* is a western replacement of *morsitans*.

The appearance of the adult male is as follows: Antenna plumose on basal two thirds, apical third with short hairs. Palps dark brown with about 4 pale or definitely white rings, the penultimate and antepenultimate segments with many

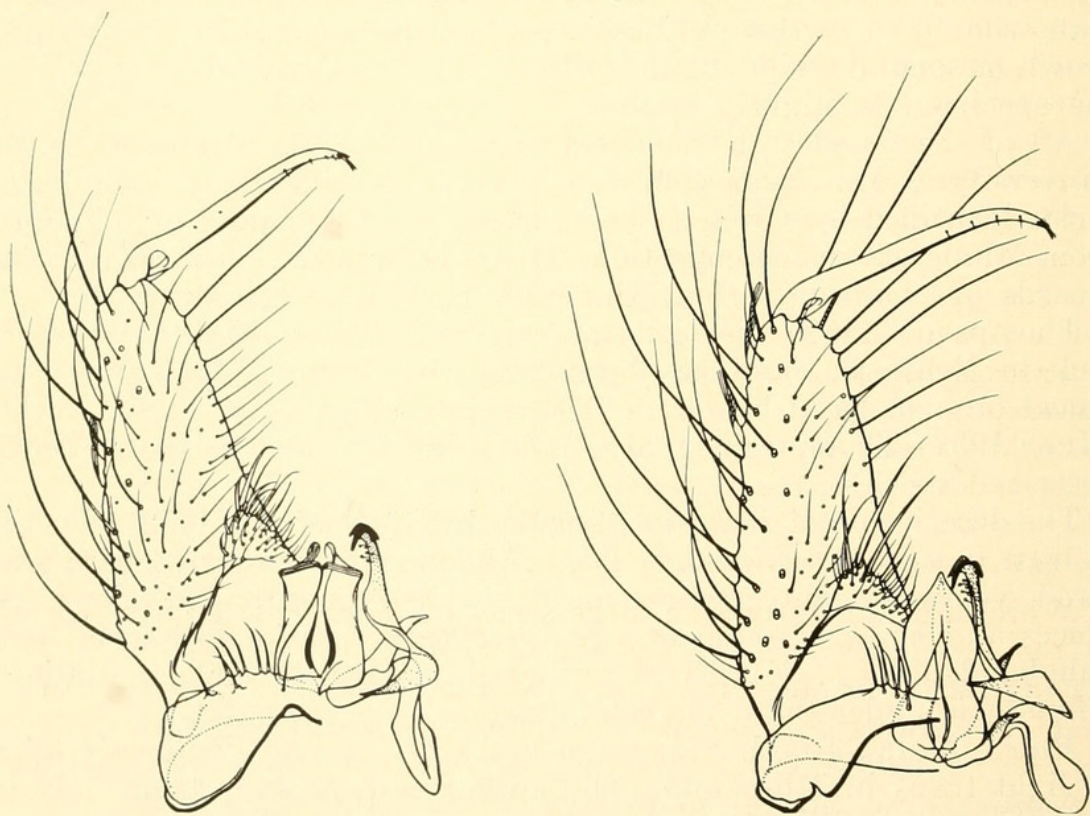


long hairs; about one-third again as long as the proboscis. Proboscis dark but with a sprinkling of pale scales. Abdominal tergites with definite, basal, white bands covering the anterior third to half of the tergite. Eighth segment with dorsal sclerite (sternite) extensively covered with white scales. Sternites for the most part pale scaled basally and dark scaled apically but with posterior sternites (including tergite of eighth segment) largely pale-scaled. Wings with little or no pale scaling on costal margin; concentration of scales at base of  $R_{4+5}^9$  usually not evident. Legs with fewer pale scales than in the female.

*Terminalia*.—The terminalia of *minnesotae* are similar to those of *morsitans* but differ in the shape of the aedeagus, as can be seen in the illustrations below.

#### SYSTEMATIC POSITION

It would appear that *minnesotae* is closely related to *morsitans* but the species cannot be assigned to a subgenus with certainty until larvae have been examined. The author has not yet collected immature stages<sup>2</sup> of this species.



Left: *Culiseta minnesotae*. Right: *C. morsitans*.

#### BIOLOGY

The larvae would be expected to occur in semi-permanent marshes. Females, but no males, were taken in a light trap at Virginia, Minn., from May 2 to 7, 1953, along with females of *Anopheles earlei*, *Culiseta inornata*, and *Culex territans* (= *apicalis* auct.). All appeared to be

<sup>2</sup>Currently being described by Dr. Roger Price at the University of Minnesota.



old, overwintered females. This would suggest that *minnesotae* hibernates as an adult female and not as a larva, as has been suggested for *morsitans*. In these light-trap collections, *Aedes* adults first appeared on May 9, which was consistent with the larval survey. No males of *Anopheles*, *Culex*, or *Culiseta* were taken until June 10, when an *inornata* male was captured. Adults have not been taken in hand catches.

*Distribution*.—In Minnesota females have been tentatively identified from Lake, St. Louis, Beltrami, Clearwater, Polk, and Hennepin Counties. Males have thus far been identified from Blue Earth (Mankato) as well as Beltrami (Bemidji), Clearwater, and Hennepin Counties. The species appears to be present also in the Pacific northwest.

#### ACKNOWLEDGEMENTS

The author would like to express his thanks to Dr. Alan Stone, of the U. S. National Museum, for comparing females of *minnesotae* with those of *morsitans* and *parodites* and for his many helpful suggestions, and to Sylvia Barr for preparing the illustrations and for her advice and criticism.

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#### A MAYFLY GYNANDROMORPH

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While working through a large series of *Hexagenia* adults collected at the Pearl River, Lawrence County, Miss., on August 16, 1954, I was attracted to one with a most unusual color pattern. Closer examination revealed that the specimen was a gynandromorph. As there are only two species, *Hexagenia bilineata* (Say) and *H. munda elegans* Traver, present in the collection, I am referring the gynandromorph to *elegans*. This reference is justified on the basis of the wing pattern and the structure of the genitalia.

This odd individual represents the first gynandromorph reported in the family Ephemeridae. As there are relatively few mayfly aberrations known, I felt that this additional find should be brought to the attention of entomologists.

The specimen (Figs. 1-4) is predominantly female. The wings have the typical maculation of this sex, lacking the dark coloration of the



1957. "A new species of *Culiseta* (Diptera: Culicidae) from North America." *Proceedings of the Entomological Society of Washington* 59, 163–167.

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