

NOTES ON THE BIOLOGY OF *CULISETA MELANURA*
(COQUILLET)^T

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Studies of the ecology and bionomics of mosquitoes have been limited chiefly to species which feed on man to the extent that they are either extremely pestiferous or are important as disease vectors. However, as epidemiological studies point out the importance of mosquitoes as vectors of arthropod-borne diseases, knowledge of the not so well-known species is becoming more and more important. There is little information available concerning *Culiseta melanura*, and the purpose of this article is to report observations on the biology of this species.

The small, dark *Culiseta melanura* are very similar in gross appearance to *Culex pipiens*. Matheson (1944) stated that they are rare and local except in some southern localities. They are known to breed in permanent fresh-water swamps and marshes. They occur in the eastern United States from the Gulf coast to Canada. Among northern Atlantic coast states this species has been reported from Maryland (Bishopp, Cory and Stone, 1933); Delaware (MacCreary and Stearns, 1935); New Jersey (Headlee, 1945), (Smith, 1904); New York (Felt, 1904), (Dyar, 1928); Rhode Island (Knutson, 1943); Massachusetts (Tulloch, 1939); and New Hampshire (Lowry, 1929). The author has found no report of this species from Connecticut up to the present time.

While collecting mosquitoes in a small cave near Shade Swamp, Bristol, Connecticut, November 3, 1953, an adult female *C. melanura* was caught and transported to the laboratory. The specimen was placed in a warm (room temperature—mean 76° F. ± 5 degrees) moist lantern cage provided with a small water container for oviposition. Sucrose solution for food was provided daily. On November 25 a small, dark *Culex*-like egg raft

was observed on the oviposition site. This was removed and placed on the water surface in a larval-rearing pan, and within two days about a hundred larvae had emerged. These were allowed to develop under routine rearing conditions in white enameled pans containing about one inch of tap water and a few laboratory Purina rabbit feed pellets. While the larvae exhibited very little activity, growth was rapid and the first pupae developed on December 4. As they developed, pupae were transferred to water in the cage. All pupation was complete by December 11. Within three days of pupation adults began to emerge, and a total of eighty-three were collected. These were transferred to a one cubic-foot cage in which humid conditions were maintained. Blood meals were offered daily, both by extending the bared forearm into the cage and by placing a chicken in the cage for fifteen minute periods. This procedure was continued as long as adult mosquitoes remained alive. However, none of the females took blood, and no indication of mating or swarming activity was observed. Adult mortality continued daily, and by January 1 none of the original laboratory reared generation remained alive.

In commenting on the biology of *C. melanura*, Matheson (1944) said there was nothing known of its habits. He indicated that this species breeds in permanent water in swamps, and that the larvae overwinter under the ice in these places. Carpenter (1946) also said that this is believed to be the means of overwintering for *C. melanura* in the northern parts of the range. Smith (1904) reported that when larvae were collected in the field under winter conditions they failed to develop in the warm laboratory. He concluded that there was a period of suspended development during the larval stage in winter months, with exceptionally

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slow growth in the spring and a long delay before pupation. Felt (1904) wrote that the thin black-shelled eggs are laid singly on the surface of the water, and that breeding is probably continuous, with the adult hibernating.

While it is possible that the mosquito overwinters both in the larval stage and as hibernating adults, the author's observations indicate that as far north as Connecticut there are females prepared to lay eggs as late in the fall as December. When eggs from such females were collected and kept in the laboratory, they developed at a rate comparable to that of laboratory-reared *Culex*, and if sufficient food and warmth were provided in the aquatic medium there was no subsequent delay in development during the larval growing period as reported by Smith (1904). This suggested that either his larval-rearing techniques did not provide sufficient temperature or nutrient requirements, or that larvae could be conditioned by a cold winter aquatic environment so that development was delayed even when larvae were brought into room temperature laboratory conditions.

Because the lack of activity observed in the cage resembled that of strongly eurygamous species of mosquitoes, it is probable that this form will not be easily adaptable to colonization under laboratory conditions. Also, under the laboratory conditions employed here, *C. melanura* could not be induced to feed on either

man or chickens; therefore, further experiments will be necessary in order to determine the host which it prefers as a source of blood.

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