

10 x 75 mm culture tubes and the volume of medium was kept fairly constant at 3.5 ml. The temperature was fairly constant at 27° C. In the inverted tubes small air pockets often developed at the closed ends. These pockets were removed at intervals. This air presumably had been exhaled by the larvae. Forty larvae were placed in inverted tubes, and 4 of these pupated. Larval mortality usually occurred in the 4th stage. In 25 upright tubes used as controls, 7 larvae pupated, and 5 adults emerged. In the inverted tubes the 4 pupae apparently died because they were unable to orient themselves so as to obtain sufficient air.

Reference

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A COMPARISON OF EGG PRODUCTION OF *CULEX PIPPIENS PIPPIENS* L. FED ON AVIAN AND MAMMALIAN HOSTS¹

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Previous workers have reported differences in egg production of various subspecies of *Culex pipiens* when fed on avian and mammalian hosts. Woke (1937) reported greater egg production from canary-fed mosquitoes than from mosquitoes fed on man. Shelton (1972) found that *C. salinarius* also produced more eggs after feeding on avian hosts.

An extended study of host preference of *C. p. pipiens* at waste lagoons in Indiana is being conducted. In the course of this study it was observed that mosquitoes which fed on an avian host produced approximately twice as many egg rafts per cage than did mammal-fed mosquitoes. However, the clearest demonstrable difference was in the size of egg rafts.

Three caged populations were established from larvae obtained at waste lagoons in the summer of 1971, and were maintained under a 15-hour photoperiod and standard temperature and humidity conditions. Adults were routinely provided

sucrose. Harnessed *Coturnix* quail were the only host for two cages, while a third was given only narcotized guinea pigs. Neither the fertility, nor the quantity of blood ingested by each female was determined. Egg counts were made under a dissecting microscope of only obviously intact egg rafts included in the samples collected from each cage of mosquitoes.

Data from these observations are summarized in Table 1. Apparent differences in egg yield between quail-fed and mammal-fed mosquitoes were confirmed by the paired t test, which was significant at the 5 percent level ($t=7.99$, with 7 d.f.) (critical region <-2.365 and >2.365).

One gains the impression from the literature and recently reported research that *C. p. pipiens* is a preferential avian feeder. Obviously, a high fecundity associated with preference for certain wild blood hosts amounts to adaptive advantage, and could have been derived through natural selection. Some increase in egg production by laboratory selection was reported by McCray and Schoof (1970), whereas egg production from the P1 to F5 generations of *C. p. quinquefasciatus* increased from 30 to 100 or more per rabbit blood meal. Egg production per chicken blood meal was 200 in both P1 and F5 generations.

The higher egg production of bird-fed house mosquitoes is not due to higher volume of intake, according to Woke (1937). The reasons for this

TABLE 1.—Egg production of *Culex pipiens pipiens* L. fed on *Coturnix* quail and guinea pig.

Observation day	<i>Coturnix</i> quail host	Guinea pig host
	Egg rafts examined	Egg rafts examined
	80	69
	Average egg/raft	Average eggs/raft
1	200.000	142.273
2	245.000	136.842
3	170.000	135.625
4	260.000	158.333
5	171.875	105.000
6	167.000	107.500
7	241.000	132.500
8	218.063	140.000
	Mean no. eggs/raft	Mean no. eggs/raft
	209.063	132.259
	Ratio of means	Ratio of means
	1.58	1

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difference invite investigation, as do the influence of parent blood source on larval survival, developmental rate, and larval weight at hatching. Egg production in *C. p. pipiens* may vary with different avian hosts, as reported by Bennett (1970) for *Aedes aegypti*.

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A DISTRIBUTIONAL NOTE FOR *CULISETA SILVESTRIS MINNESOTAE* BARR¹

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Seven female mosquitoes collected July 14, August 3 and August 4, 1972, in dry-ice-baited, miniature CDC light traps located at Dewey's Pasture (T97N, R35W, Sec. 25), Clay County, Iowa, were identified as *Culiseta silvestris minnesotae* Barr. This represents a new state record and brings the total mosquito species recorded for Iowa to 45. There are no male or larval records for this species in Iowa at this time.

Dewey's Pasture is located 5.4 miles northwest of Ruthven and approximately 25 miles south of the Minnesota border in northwestern Iowa. There are many permanent and semipermanent marshes in this area that may serve as the breeding habitat, as indicated by Price (1961).

This species, originally described by Barr (1957) as *Culiseta minnesotae*, has been assigned as a subspecies of *Culiseta (Culicella) silvestris* (Shingarev) by Stone (1967).

Similarities between *C. morsitans dyari* (Coquillett) and *C. s. minnesotae* prompted re-examination of the voucher specimen of *C. m. dyari* (Iowa Insect Collection) collected in Story County in 1969 (Pinger and Rowley, 1972). It was verified as *C. m. dyari*. Three females collected in the northern Iowa counties of Cerro Gordo, Kosuth and Winneshiek in September 1971 also were identified as *C. m. dyari*.

States bordering Iowa that have reported *C. s. minnesotae* are Minnesota, Wisconsin and Illinois. A further indication of this species' northern distribution in the United States is its reported presence from Connecticut, Delaware, Idaho, Massachusetts, Michigan, Montana, New Jersey, Utah and Washington (Carpenter, 1968 and 1970).

Voucher specimens have been placed in the Iowa Insect Collection located at Iowa State University.

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