

# THE MOSQUITOES (CULICIDAE) OF THE MISSOURI VALLEY REGION OF NEBRASKA<sup>1</sup>

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Since the publication of the bulletin on the mosquitoes of Nebraska (Tate and Gates, 1944) many ecological changes have taken place, resulting in many changes in the mosquito population. This early work reported thirty-three species of the state and discussed them in a general way, giving no details on the mosquitoes of specific regions.

In the spring of 1952 there occurred the most disastrous flood of recent times in the Missouri Valley. As a result of this flood large areas of standing water were left in many areas of the flood plain. It was felt that this standing water represented a potential mosquito breeding area. Since little was known about the mosquitoes of the Missouri Valley of Nebraska it was decided to run a series of New Jersey mosquito light traps through the area.

**ECOLOGY.** The Missouri Valley region of Nebraska represents the western extremity of the eastern deciduous forest biome. In the early days this forest area formed a strip ten miles wide, but modern agriculture has narrowed this forest strip so today it seldom reaches a mile in width. This forest river-fringe forms a sharp and conspicuous ecotone. Intergradation between the deciduous forest and grassland is extremely minor. In the case of mosquitoes this lack of intergradation is very noticeable. Rapp (1955) has shown that *Culex tarsalis* is found principally in the grasslands and is only rarely or accidentally found in the forested areas. The deciduous forest is composed principally of an oak-walnut community with a

fringe area of willow. The shrub community is minor and in many areas is lacking due to destruction by cattle or frequent flooding. With the construction of large dams on the upper reaches of the Missouri by the Corps of Engineers, no longer will it be possible for floods of the magnitude of the 1952 flood to occur. Therefore, in time we can expect to find a well developed shrub community along the Missouri River especially since farmers are slowly learning that woodlands are not good areas to graze cattle.

**LIGHT TRAP LOCATIONS.** New Jersey type light traps were run at six locations. All light traps were run within the corporate limits of the cities so that they would sample the mosquitoes which were annoying the residents. The location of the traps and the number of nights of operation at each site were as follows: Rulo, 84; Peru, 48; Plattsmouth, 38; Blair, 45; Tekamah, 75; Dakota City, 16.

Figure 1 shows the geographic location of light traps.

**MOSQUITOES TAKEN.** Twenty-two species were taken, with a total of 4207 individuals.

*Anopheles barberi* Coquillett. Only one specimen of this tree hole breeder was taken at Rulo.

*Anopheles punctipennis* (Say). This species is the commonest *Anopheles* in Nebraska and is most abundant in this region.

*Anopheles quadrimaculatus* Say. This species is of no medical importance in Nebraska. It reaches its largest population in Nebraska in the Missouri River region. The species seems to reach its peak abundance during August.

*Anopheles walkeri* Theobald. This species was taken only at Rulo and Tekamah; in both of these areas are large cattail (*Typha latifolia* L.) marshes which are especially favorable for this species.

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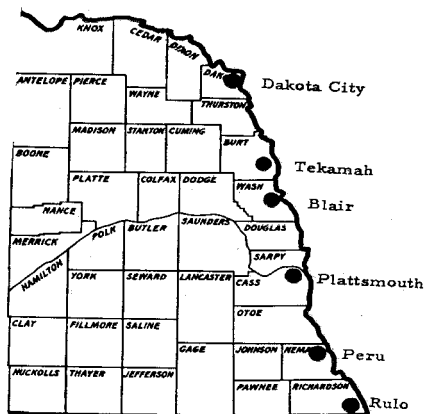


FIG. 1.—Eastern Nebraska showing location of trap sites in Missouri Valley.

*Uranotaenia sapphirina* (Osten Sacken).

This species is very rare in this region, only one specimen being taken at Blair in September.

*Culiseta inornata* (Williston). This species is of minor importance and occurs during June and September.

*Orthopodomyia signifera* (Coquillett). This tree hole species was taken only at Plattsmouth in August.

*Psorophora ciliata* (Fabricius). This species reaches its western limit in the eastern third of Nebraska.

*Psorophora confinnis* (Lynch Arribalgaza). This species is locally abundant in the Missouri River Valley region. The Peru area had the largest population during the 1952 season.

*Psorophora discolor* (Coquillett). This species was taken throughout the Valley but was most abundant in the Peru area where it represented 9 percent of the total catch.

*Psorophora ferox* (Humboldt). On June 3 and 4, 1953 the writer and Leslie D. Beadle, United States Public Health Service, made biting collections in the river bottom forests south of Rulo. This species represented 1 percent of the species collected.

*Psorophora horrida* (Dyar and Knab). On the evening of June 3, 1952 the writer and Leslie D. Beadle took two specimens of this species in a biting collection at Rulo.

*Psorophora signipennis* (Coquillett). Tate and Gates (1944) found that this species was abundant in certain areas but in the Missouri Valley region it is a rare species.

*Aedes cinereus* Meigen. This is a rare species in Nebraska and only two specimens were taken at Blair, in late July and early August.

*Aedes dorsalis* (Meigen). Although this species is of major importance in the irrigated lands of western Nebraska, it is of minor importance in the Missouri Valley region.

*Aedes nigromaculis* (Ludlow). Tate and Gates (1944) regarded this species as a major pest. In the Missouri Valley region it was rare except in the Peru area where it represented 16 percent of the total catch.

*Aedes sticticus* (Meigen). Many workers feel that this is a river valley breeder; however, it is rare in the Missouri Valley region. Two specimens were taken by light trap in Tekamah in June. Apparently this species does not come readily to light as the writer and Leslie D. Beadle in June, 1953 took one adult at Ponca State Park at Dixon County and three adults in woodland areas south of Rulo.

*Aedes trivittatus* (Coquillett). Tate and Gates state that this is a common species in eastern Nebraska. Our work indicates that it is rare in the Missouri Valley region.

*Aedes vexans* (Meigen). This is the most abundant species in the Missouri Valley region. There are apparently several broods per year as specimens were taken throughout the entire trapping period.

*Culex pipiens* Linnaeus. This is the second most abundant species in the Missouri Valley region.

*Culex restuans* Theobald. This species was found throughout the Missouri Val-

ley region, but was especially abundant at Rulo and Tekamah.

*Culex salinarius* (Coquillett). This species was rare except at Rulo where 25 specimens were taken.

*Culex tarsalis* (Coquillett). In general this species is uncommon in the Missouri River Valley of Nebraska (Rapp, 1955). However, at Blair, it was second in abundance and represented 34 percent of the total catch.

*Culex territans* Walker. This species was taken at several locations throughout the region.

The numerical rank of some of the mosquitoes found in the Missouri Valley region of Nebraska as compared to the state as a whole was as follows, the rank for the state, based on Tate and Gates, being given in parentheses:

- 1, *Aedes vexans* (1); 2, *Culex pipiens* (8); 3, *Culex tarsalis* (2); 4, *Psorophora ciliata* (17); 5, *Aedes nigromaculis* (5); 6, *Psorophora discolor*\*; 7, *Culex restuans* (10); 8, *Culex salinarius* (7); 9, *Anopheles punctipennis* (12); 10, *Aedes trivittatus* (9).

It is interesting to note this lack of conformity between the two lists. Tate and Gates had their light traps spread over the entire State and their data shows a pattern representative of the grassland areas, but not of the deciduous forest area.

The use of light traps alone tends to give

a misleading picture. This is well illustrated by the fact that *Psorophora ferox* and *P. horrida* were never taken by light trap whereas they were readily taken in biting collections. Also, larval collections indicate the presence of species not readily attracted to light or to man.

SUMMARY. A total of 25 species were collected in the Missouri Valley region of Nebraska during the summer of 1952. The following four species made up 84 percent of the mosquito population: *Aedes vexans* 63 percent, *Culex pipiens* 10 percent, *Culex tarsalis* 8 percent, *Psorophora ciliata* 3 percent. Two of these species are important vectors of encephalitis; *C. pipiens* is considered the prime vector of St. Louis encephalitis and *C. tarsalis*, the prime vector of western equine encephalitis. In spite of the fact that spring floods left many pools of standing water on the lower flood plain of the Missouri River, large mosquito populations were not found. This may be explained by the fact that most of the pools of flood water had dried up by the middle of July.

#### Bibliography

TATE, H. D. and GATES, D. B. 1944. The mosquitoes of Nebraska. University of Nebraska, College of Agriculture. Research Bulletin 133: 1-27.

RAPP, WILLIAM F., JR. 1955. *Culex tarsalis* and the Grassland Biome. Proceedings and Papers of the 23rd Annual Conference of the California Mosquito Control Association and the American Mosquito Control Association, pp. 89-90.

\* Not listed by Tate and Gates.