

\$0.12. Longer rental periods (7 months) result in lower rent, and bring the total cost per mile down to between \$0.10 and \$0.11. There are many ways to calculate depreciation but the figures presented herein are based on 20 percent depreciation per year. On this basis, the cost per mile, including depreciation or rent, ranges from 1 to 3.78 times operating costs per mile. Within reason, as miles driven increases, the cost per mile decreases.

Table 3 presents the total repair costs for all District-owned and leased vehicles from 1958 through 1963. All repairs were accomplished at commercial garages and the only billing concession received

TABLE 3.—Vehicular repair costs.

Year	Vehicles owned and rented	Repair cost
1958	32	\$ 840.05
1959	53	4,226.64
1960	62	8,174.68
1961	54	6,638.60
1962	70	1,667.47
1963	85	4,520.96

was that parts were discounted. It is obvious that this District could not equip and staff a garage for less money than these totals. Many large commercial garages remain open for 16 hours daily in this metropolitan area so repairs normally can be accomplished promptly.

## LABORATORY REARING OF *URANOTAENIA ANHYDOR* DYAR (DIPTERA:CULICIDAE)

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In the United States the genus *Uranotaenia* consists of three species and one subspecies. Until the excellent ecological and taxonomical studies by Belkin and McDonald (1956), *U. anhydor* Dyar was considered to be a very rare species and was known from only small adult or larval collections in Nevada, Arizona, California, and Baja California. This species is reported in California from San Bernardino and San Diego Counties (Belkin and McDonald 1956) and from Inyo County (Loomis *et al.*, 1956).

The writer collected several hundred third and fourth instar larvae of *U. anhydor* approximately 6 miles east of Ban-

ner, California, in San Diego County, IV-10-63. The habitat was a small, open, slightly alkaline seep pool in a swampy area with *Scirpus olneyi* Gray, the principal vegetation in the area. These larvae were transported 360 miles to Fresno in small ice-cream cartons with little apparent mortality.

Approximately 90 adults were reared from a portion of the larval material and placed in a cage (9" x 9" x 11") containing raisins and a jar of pond water. The rearing room was held at approximately 70° F. and 70 percent relative humidity and supplied with 17 hours of normal white light, 2 hours of red light, and 5 hours of darkness. These conditions were maintained for 32 days during which time no autogenous development of eggs was observed.

<sup>1</sup>In cooperation with the California State Department of Public Health, Bureau of Vector Control, Fresno, California.

After the 32nd day, a western toad (*Bufo boreas* Baird and Girard) was placed in the cage and all of the remaining females fed immediately. Some females fed five separate times and matured an egg raft after each blood meal. Adult females fed in a rather leisurely fashion with an average engorgement period of 10 (range 8-15) minutes. The preovipositional period was 4-5 days at 70° F. The maximum lifespans of a male and female at this temperature were 49 and 55 days, respectively.

The egg rafts were ovate, blackish, and possessed an abundance of easily discernible apical drops. The average number of eggs in 11 rafts was 88 (range of 50-105). Of 11 egg rafts, 9 were viable and hatched in 2½ to 3½ days at 75° ± 3° F.

Larvae were reared in various aerated, distilled waters containing high-protein pellets and in infusions of leaf or straw supplemented with dry baker's yeast. Growth was most rapid in the high-protein pellet pans held at a constant temperature of 77° F. with the aquatic cycle completed in a minimum time of 11 days. Each larval instar and the pupal stage required 2-3 days. This finding compared with the 2-week interval to obtain fourth instar larvae from eggs and a pupation period of 2 days as reported by Belkin and McDonald (1956).

This species has now been carried through ten generations. Egg raft production has been good and all egg rafts through the sixth generation, with few exceptions, have been viable. M. M. Boreham, Assistant Vector Control Specialist, in charge of colonies at the Bureau of Vector Control laboratory in Fresno, assumed control of this colony after the sixth generation.

Very little is known of the feeding habits of adult American *Uranotaenia* species and nothing is reported on the hosts of *U. anhydor*. Belkin and McDonald

(1956) reported an abundance of gravid females but no blooded females in their collections from the Saratoga Springs area. Because they found no blood-engorged females, they suggested *U. anhydor* might not need a blood meal to produce eggs. The writer observed additional feeding of *U. anhydor* in the laboratory on the Yosemite toad (*Bufo canorus* Camp) and a bullfrog (*Rana catesbeiana* Shaw). No feeding was noted on a human arm, salamander, or chicken.

No evidence was seen that would substantiate the observations mentioned by Seaman (1945) that *U. anhydor* larvae were predacious on mosquito larvae. *U. anhydor* larvae were never observed attacking various instars of their own kind or species of *Culex* and *Culiseta*.

It is apparent that this small mosquito is easily adapted to colonization since the adults are relatively long lived, mate readily in small cages, and feed avidly on known hosts. The aquatic stages also have a moderate growth rate and are easy to rear.

If it is as easy to rear continuous generations of *U. anhydor syntheta* Dyar and Shannon and the isolated Saratoga Springs population of *U. anhydor*, which may be a distinct subspecies (Belkin and McDonald 1956), then such material would permit hybridization and chaetotactic studies that should shed light on their true taxonomic status.

#### References Cited

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