Table 1. Results of field trials with Dursban as a larvicide in pipelines

	Pipeline	Treatment	Distance to Cups			% Mortality/hrs			Hrs to 100%
1	1173	1	445	843	1173	100/2	100/2	100/2	2
2	1415	1	495	1093	1415	100/5	40/5	0/5	17
3	1130	1	417	902	1130	100/2	85/2	0/2	15
4	887	1	527	887	—	100/5	0/5	—	28
5	1805	1	511	1101	1805	100/1	100/2	100/2	2
6	1435	1	489	995	—	100/3	100/3	—	3
7	885	2	325	885	—	100/3	100/3	—	3
8	1061	3	313	590	1061	100/3	100/3	100/3	3

fogger will move through a pipeline with larvicidal effects. Percent mortality in relation to time was random. Dursban and GB–1111 oil proved to be a satisfactory insecticidal mixture for the control of *Cx. pipiens* larvae in irrigation pipelines.

References Cited

Gieke, P. A. 1976. Adult mosquito control in pipelines with a modified non-thermal aerosol generator. Mosquito News 36:280–283.

Silveira, S. and Mulhern, T. D. 1961. An effective method of distributing insecticidal dust throughout underground pipelines to control mosquitoes. California Vector Views 8:38–41.

BIPOLAR GYNANDROMORPH OF *AEDES FITCHII*[1]

JAMES T. KARDATZKE

U.S. Army Medical Bioengineering Research & Development Laboratory, Fort Detrick, Frederick, Maryland 21701

In June 1975 a female *Aedes fitchii* (Felt and Young) was collected at Rowley Bay, Door County, Wisconsin, while feeding on a human. Eggs from the female were conditioned to a hatchable state using procedures described and cited by Kardatzke (1976). After collection, neither this female nor her eggs were exposed to temperatures in excess of 21°C. In March 1976, 50 eggs from this single female were hatched at 10°C using cysteine to reduce the level of dissolved oxygen (Kardatzke 1977). Approximately 40 normal appearing larvae hatched. These were reared in 2 trays at 21°C in a non-saline medium as described by Kardatzke and Liem (1972). When adults, the siblings were mated using induced copulation (McDaniel and Horsfall, 1957 as modified by Novak and Liem, 1975). During this procedure the gynandromorph was discovered.

The gynandromorph of *Ae. fitchii* was bipolarly differentiated into male and female. The antennae, maxillary palpi, and proboscis were female in appearance. The genitalia were entirely male. All other siblings from this female were normal and mated. Normal viable eggs were obtained from these matings.

This is the first report of a non-thermally induced gynandromorph of *Ae. fitchii*. It was a phenotypic expression of a genotype and not related to environmental stress. This also is the first incidence where the gynandromorph was directly related to its siblings and mother.

References Cited

Kardatzke, J.T. 1976. Maintenance and transportation of female mosquitoes collected in the field. Mosquito News 36:527–29.

Kardatzke, J.T. 1977. Hatching of northern *Aedes* (Diptera: Culicidae) at low temperatures. Ann. Entomol. Soc. Am. 70:663–4.

Kardatzke, J.T. and K.K. Liem. 1972. Growth of *Aedes stimulans* and *A. vexans* (Diptera: Culicidae) in saline solution. Ann. Entomol. Soc. Am. 65:1425–6.

McDaniel, I.N. and W.R. Horsfall. 1957. In-

[1] The opinions or assertions contained herein are the private views of the author and are not to be construed as official or as reflecting the views of the Department of the Army or the Department of Defense.

duced copulation of aedine mosquitoes. Science 125:745.
Novak, R.J. and K.K. Liem. 1975. Induced copulation of mosquitoes: effect of humidity on insemination. Mosquito News. 35:409–10.

USE OF SUGAR CUBES AS A CARBOHYDRATE SOURCE FOR ADULT *CULEX QUINQUEFASCIATUS* SAY

URSULA B. POLK

Stauffer Chemical Company,
P. O. Box 760,
Mountain View, Calif. 94042

It was reported by Eliason (1963), that various species of mosquitoes could feed on crystallized sugar. However, there was no indication that this finding was put to practical usage in maintaining laboratory colonies of such species over an extended period of time. Nor was there mention of any comparative studies to determine if physiological differences such as increased oviposition or extended adult longevity could be detected between the utilization of solid sugar and other carbohydrate sources. I report now on laboratory research which addressed such problems.

A colony of *Culex quinquefasciatus* Say is maintained at this laboratory for insecticidal research. Our original rearing procedure required raisins as adult food for both sexes. In addition, the females received a blood meal to initiate oviposition. A chance observation that mosquitoes would feed on sugar cubes led to a study in which the cubes were compared with raisins as a carbohydrate source.

Two groups of 200–300 adult mosquitoes of mixed sexes were placed in identical 1 ft^3 screened cages. They were supplied water *ad libidum*, 5 sugar cubes (group A), or 15 raisins (group B). After 3 days, both groups were starved for 24 hrs (sugar cubes and raisins removed) after which the females were provided a chicken as a blood source. Sugar cubes and raisins were replaced after the blood meal was completed. Oviposition cups containing tap water were placed inside each cage on the third day after the blood meal. Eggs were collected 24 hrs later. The experiment was repeated 3 times.

Females of group A (sugar cubes) took 3 to 4 blood meals and the same number of ovipositions were obtained (2 heavy, 1 medium, and 1 light). Adults of group B (raisins) did not live long enough to take more than 1 blood meal. Although no direct counts were made, the viability of the eggs appeared to be greater than 90%.

In summary, our research has shown that the insects not only prefer sugar cubes as a carbohydrate source, but that they live 3–4 times longer than those fed on raisins. Sugar cubes have now been used successfully as a carbohydrate source for both female and male adult mosquitoes in our colony for almost 2 years.

References Cited

Eliason, D. A. 1963. Feeding adult mosquitoes on solid sugars. Nature 200:289.

LARVAL SPECIMENS OF *CULEX TARSALIS* COQUILLETT IN OHIO

LEE MITCHELL AND C. LEE ROCKETT

Department of Biological Sciences,
Bowling Green State University,
Bowling Green, Ohio 43403.

Weekly larval mosquito surveys have been conducted by the authors during the period May through September for the past 3 years in Bowling Green, Ohio. *Culex tarsalis* Coquillett larvae have not been previously reported from Ohio, although adults of this species have been collected occasionally in light trap surveys (Ms. Margaret Parsons, Ohio Dept. of Health, personal communication). *Cx. tarsalis* larvae (61 specimens) were collected at 10 different locations from 28 July through 9 September 1977. The habitats were usually temporary, standing water sites with emergent vegetation. The most common larval associates with *Cx. tarsalis* were *Cx. pipiens, Anopheles punctipennis,* and *Cx. restuans*, although *Cx. tarsalis* larvae were also found with an additional 8 species. Adults of this species were collected infrequently in New Jersey light traps and CO_2 baited CDC light traps. *Cx. tarsalis* adults were not collected from