THE ASSOCIATION OF ARTIFICIAL CONTAINERS AND LACROSSE ENCEPHALITIS CASES IN MINNESOTA, 1979

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Larvae of *Aedes triseriatus* (Say), the vector of LaCrosse (LAC) encephalitis, develop in discarded automobile tires and other containers in addition to tree holes (Thompson et al. 1972, Watts et al. 1974, Balfour et al. 1975). The importance of these containers in the etiology of LAC encephalitis has been documented (Parry et al. 1983).

LaCrosse encephalitis occurs in southeastern Minnesota. The endemic zone includes counties bordering Wisconsin up to the metropolitan area surrounding Minneapolis and St. Paul and includes portions of Hennepin and adjacent counties south and west of Minneapolis (Balfour et al. 1976). This note reports results of investigations of the association of artificial containers and reported cases of LAC encephalitis in MN during 1979.

Physicians and hospitals in southeastern Minnesota were notified and requested to report suspect LAC encephalitis cases to the Minnesota Department of Health (MDH) and to submit acute and convalescent serum specimens for confirmation. Acute sera were screened for antibody to LAC virus by counter immune electrophoresis (CIE) by the University of Minnesota Hospitals Virology Laboratory (Balfour et al. 1973). Paired sera were tested for hemagglutination-inhibition (HI) antibody at MDH (U.S.D.H.E.W. 1969). Positive test results were telephoned to physicians. Permission was then obtained to interview the patient's family. Information was collected on the patient, the patient's residence, and history of travel to wooded areas where exposure to *Ae. triseriatus* may have occurred within 3 wk of onset. Investigators from the Metropolitan Mosquito Control District (MMCD) made follow-up inspection visits to residences in the metropolitan area. Inspections in other areas were performed by MDH staff.

The areas surrounding case residences were examined for the presence of artificial containers. Searches were conducted in the immediate vicinity of the residence, along the fringe of nearby wood lots, and along regularly used pathways and play areas. Mosquito larvae were collected from containers and identified by field personnel. Samples of field-collected specimens were identified at MMCD (Siverly 1972). No attempt was made to isolate virus from any specimens.

Results of the investigations are summarized in Table 1. Interviews and site surveys were completed for 22 cases confirmed by a fourfold or greater rise in HI antibody titer and 12 cases presumed due to LAC virus based on a positive CIE test and an HI titer $\geq$ 1:80 (8 cases) or a positive CIE test alone (4 cases). Investigations were completed between July 25 and October 2. Investigations were not attempted on four confirmed and seven presumed cases reported after October 2. Some type of artificial container was found near the residence of 32 (94%) cases. *Aedes triseriatus* larvae were collected from tires (15 cases), metal containers (5 cases), plastic containers (4 cases) and a fiberglass water trough (2 cases). *Culex restuans* larvae alone were collected from containers associated with seven (21%) cases.

Table 1. Results of follow-up investigations on 34 cases of LaCrosse encephalitis, by source of exposure. Minnesota, 1979.

Presumed source of exposure[1]	No. containers present	No. mosquito larvae present	*Culex restuans* larvae present	*Aedes triseriatus* larvae present	Total cases investigated
Residence	1 (6%)	1 (6%)	2 (12%)	14 (78%)	18
Other	1 (6%)	5 (31%)	5 (31%)	5 (31%)	16
Total	2 (6%)	6 (18%)	7 (21%)	19 (56%)	34

[1] Source of exposure presumed due to residence if patient had no exposure to *Aedes triseriatus* habitats other than around residence within three weeks of onset of symptoms. Other exposures include camping in or visiting wooded areas in Southeastern Minnesota orWisconsin.

[2] *Culex restuans* larvae present in the absence of *Aedes triseriatus*. *Culex restuans* were also collected from some containers with *Aedes triseriatus* present.

The association between the presence of *Ae. triseriatus* larvae in containers and a history of exposure near the residence is presented in Table 2. *Aedes triseriatus* larvae were collected

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Table 2. Association between residential exposure and presence of *Aedes triseriatus* larvae in containers.

Exposure[1]	Present	Absent	Totals
Residence	14	4	18
Other	5	11	16
Totals	19	15	34

Chi-square with Yates correction for continuity = 5.67, $p < 0.02$

[1] Source of exposure presumed due to residence if patient had no exposure to *Aedes triseriatus* habitats other than around residence within three weeks of onset of symptoms. Other exposures include camping in or visiting wooded areas in Southeastern Minnesota or Wisconsin.

from containers associated with 14 (78%) of 18 cases with no history of travel beyond the neighborhood of the residence. Conversely, *Ae. triseriatus* larvae were collected from containers associated with only 5 (31%) of 16 cases who reported camping in or visiting wooded areas in southeastern Minnesota or Wisconsin within 3 wk of symptoms onset. The increased likelihood of finding artificial containers around the residences of cases who had not traveled beyond the neighborhood of the residence was significant (chi-square with Yates correction for continuity = 5.67, $p < 0.02$) (Bahn 1972). These data suggest that artificial containers may have increased the patient's risk of exposure to LAC encephalitis. These data also support work from LaCrosse, Wisconsin (Parry et al. 1983) which earlier incriminated old tires as *Ae. triseriatus* habitation around case residences in that community.

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A COMPARISON OF FEMALE *CULISETA MELANURA* CAPTURED IN NEW JERSEY AND CDC LIGHT TRAPS IN SOUTHEASTERN MASSACHUSETTS

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Light traps have been used extensively in conducting surveys and for monitoring mosquito populations. Two traps commonly used are the New Jersey (Mulhern 1942) and the CDC (Sudia and Chamberlain 1962) light traps. Trap attractiveness varies according to the mosquito community and environmental conditions (Service 1976).

This study compares the numbers of female *Culiseta melanura* (Coq.) captured in concurrently set, battery-operated New Jersey and CDC light traps. *Culiseta melanura* was selected because it is the primary vector of Eastern equine encephalitis virus and is the principal species monitored in an ongoing disease surveillance program (Grady et al. 1978). This investigation was conducted because there is currently no literature available utilizing our method of comparative trapping of this species.

Three areas in southeastern Massachusetts were sampled: 1) Pine Swamp, located in the town of Raynham, 2) Hockomock Swamp, town of Easton, and 3) Maxim's Orchard, town of Lakeville. Pine Swamp and Hockomock Swamp are freshwater swamps with dominant trees including red maple, *Acer rubrum* L., and white cedar, *Chamaecyparis thyoides* (L.) B. S. P. Maxim's Orchard is bordered on a river bottom and red maple trees dominated. In each area,

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