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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both types of light traps were set at fixed sites. In Pine and Hockomock Swamps, the sites were located along an abandoned railroad bed that transects the swamps. The traps in Maxim's Orchard were set at the boundary of the red maple swamp, the orchard and the freshwater marsh.

At each swamp area in 1974, between one and two of both the New Jersey and CDC light traps were placed at fixed sampling sites. The two types of traps were used continuously at the three sites for the sampling period of July to September. During the 1975 season, the New Jersey and CDC traps were alternated and not repeated in sequence between the sites for each area the traps were set. The schedule was maintained for the sampling period of June to August.

Traps were usually set at least twice a week per area. Even when two traps were set per night, the number of functional traps per night varied, because of malfunction or vandalism, between one and two. The trapping period extended from 1500–1600 to 0800–1000 hr of the following morning. Each collection was recorded as a trap night and the total number of female mosquitoes was recorded.

During the entire trapping period, all three areas were not always sampled on concurrent evenings. To reduce error, only the data collected on nights when the three sample areas were simultaneously sampled were used in our analyses.

Analyses were based on mean numbers of females per trap night rather than absolute numbers since the number of traps per night varied.

To measure the relationship between the two light traps, the data were separated by collection, area, and year, and the product-moment correlation coefficient was calculated (Sokal and Rohlf 1981). To measure the differences between the trap counts, the *t*-tests for paired comparison were calculated (Sokal and Rohlf 1981).

The New Jersey light traps generally captured greater numbers of *Cs. melanura.* However, the difference between the two types of light traps was significantly different in only two sampled localities (Table 1).

Of primary interest is that in all of our sampled data, the correlation coefficients were significant ($P<0.05$) to highly significant ($P<0.01$) (Table 1). This indicated that there was a significant relationship in the relative trapping capability between both types of light traps. Both traps were measuring similar patterns of changes in the mosquito densities irrespective of the types of traps used.

Our studies show that both models of light traps efficiently capture *Cs. melanura.* The high correlation values confirm that the CDC light traps presented a comparative measurement of the mosquito population as the New Jersey light traps. It is concluded that, when measuring the relative densities and changing patterns of *Cs. melanura,* the CDC light trap could be substituted for the New Jersey light trap. This would facilitate field studies because the CDC light trap is smaller and easier to transport in the field allowing the possibility of setting up more traps per day and accessibility to more areas. With the opportunity of establishing more sample sites, the resulting data would possibly be more accurately representative of the population changes which is very useful in a disease surveillance program.

Table 1. Comparison of the mean numbers of female *Culiseta melanura* caught in New Jersey (NJ) and CDC (CDC) light traps at 3 sites in southeastern Massachusetts.

			Mean number of female *Cs. melanura* per trap night			
Sampling period	Site	Trap nights	NJ	CDC	t_s	r
1974						
July 17–Sept. 10	Pine swamp	8	218	104	2.03	0.94**
July 17–Sept. 10	Hockomock swamp	8	434	74	2.60*	0.90**
July 17–Sept. 10	Maxim's Orchard	8	76	44	2.34	0.92**
1975						
June 15–Aug. 14	Pine swamp	13	178	102	2.46*	0.89**
June 15–Aug. 14	Hockomock swamp	13	262	202	0.89	0.66*
June 15–Aug. 14	Maxim's Orchard	13	34	53	−1.47	0.79**

* $P<0.05$.
** $P<0.01$.
t_s = *t*-test for paired comparison.
r = product-moment correlation coefficient.

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LARVAL DIAPAUSE IN *AEDES HENDERSONI* AND *AEDES TRISERIATUS* FROM SOUTHERN MANITOBA

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The mosquitoes *Aedes hendersoni* Cockerell and *Aedes triseriatus* (Say) are sympatric sibling species that breed in tree rot holes (Zavortink 1972). These species occur in Manitoba (Gallaway and Brust 1982), where they overwinter in the egg stage (Wood et al. 1979). Larval diapause has been demonstrated in *Ae. triseriatus* populations from as far north as 46° N latitude (Sims 1982). There is no published information on larval diapause in *Ae. hendersoni.*

Larvae from field collected eggs and the F1 generation of laboratory colonies were used to investigate larval diapause in *Ae. hendersoni* and *Ae. triseriatus* populations from Winnipeg, Manitoba (49° 52″ N latitude). Larvae from eggs collected from tree holes in late April, 1982, were reared at 20°C, 16L:8D or 8L:16D. Larvae from the laboratory colonies (maintained by forced copulation of adults) were reared at 16° C and photoperiods changing in 1 hour increments from 16L:8D to 10L:14D. The number of larvae used per test ranged from 21 to 75. Larvae not pupating after 50 days from the day of hatch were considered to be in larval diapause.

Diapause occurred in larvae of both species from field collected eggs when reared at 20°C, 8L:16D (Table 1). Diapause did not occur in any of the larvae from the laboratory colonies. Larval diapause was more prevalent in *Ae. triseriatus* than *Ae. hendersoni* (Table 1). The lower percentage of diapausing larvae in the May 5 group (Table 1) may have been due to the eggs being stored at 20°C, 16L:8D for 6 days before they were hatched, while those of April 20 were hatched on the day of collection. The duration of daylength plus civil twilight at 50° N latitude is 17.1 hr on June 15 and 8.8 hr on December 15 (Beck 1980), therefore a photoperiod of 8L:16D is not one naturally encountered by the larvae of these species at this latitude. Sims observed larval diapause at 16° C, 11L:13D in *Ae. triseriatus* collected at 46° N latitude. The short photoperiods to which my colony larvae were subjected should have induced diapause. It may be that another factor besides photoperiod and temperature influences larval diapause in these species.

Table 1. Numbers of *Aedes triseriatus* and *Aedes hendersoni* larvae from field collected eggs not pupating during a 50 day period, starting at the time of hatch. Larvae were reared at 20° C.

		Species	
Photoperiod	Date of hatch	*Ae. triseriatus*	*Ae. hendersoni*
16L:8D	April 20	0/68* (0.0%)	0/26 (0.0%)
8L:16D	April 20	58/65 (89.2%)	9/27 (33.3%)
8L:16D	May 5	9/28 (32.1%)	2/21 (9.5%)

* Fourth stage larvae alive at end of period/fourth stage larvae + pupae.

This is the farthest north that larval diapause has been demonstrated in *Ae. triseriatus* and to my knowledge the first time this response has been demonstrated in *Ae. hendersoni.* In Manitoba this response to short photoperiod could be of no importance in overwintering because the larvae would freeze during the winter, the average frost free period for Winnipeg being 121 days/year (Anonymous 1982). It has been suggested that unpredictable spring weather may be responsible for the persistence of larval diapause in northern populations of *Ae. triseriatus* (Holzapfel and Bradshaw 1981, Sims 1982). Intermittent warm and cold periods and short photoperiods may induce larval diapause, halting development until conditions are more suitable for adult survival.

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