WESTERN ENCEPHALITIS VIRUS IN PENNSYLVANIA MOSQUITOES

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Isolations of Western encephalitis from mosquitoes in the eastern United States have been made from *Culiseta melanura* and *Aedes infirmatus* in Louisiana (Kissling et al. 1955), *Cs. melanura* in North Carolina and in New Jersey (Chamberlain et al. 1958), *Cs. melanura* from Massachusetts (Hayes et al. 1961), and more recently from *Cs. melanura* in Maryland (Saugstad et al. 1972). As part of a continuation of arbovirus studies in Pennsylvania, mosquitoes were collected for virus isolation from an endemic focus of Eastern encephalitis in the Pocono region of northeastern Pennsylvania in 1976. This location was a small swamp approximately 300 yd long by 100 yd wide that drained into a 5 acre lake adjacent to a pheasant rearing farm. Outbreaks of Eastern encephalitis occurred in the pheasant flocks in 1951, 1959, 1961 and 1973, after which the pheasant rearing was terminated. Other arthropod-borne viruses are endemic to this region. Wills and Pidcoe (1972) reported neutralizing antibodies to California encephalitis virus in sentinel rabbits in 5 different locations in the area. Wills et al. (1974) isolated both South River subtype of California encephalitis virus and Flanders virus from *Cs. melanura* in a study area approximately 15 mi. from the present study site.

The mosquito collections were made using CDC light traps with a modification of the electrical system (Carroll and Wills 1973) and dry ice as an attractant. Mosquitoes were killed with dry ice, placed in shell vials with a rubber stopper, taped shut, marked and shipped in dry ice to the Bureau of Laboratories, Pennsylvania Department of Health where they were held at minus 70°C. The mosquitoes were sorted to species and pooled on a chill table. Pools were processed using the CDC method of Sudia and Chamberlain (1967) and injected intracerebrally into suckling mice. When neurological symptoms occurred in the mice, a 2nd passage was made in suckling mice at which time only positive pools were stored in the minus 70°C freezer.

A total of 263 adult females were trapped during the night of August 31, 1976. These specimens were sorted into 11 pools representing 9 species. One pool of 51 *Cs. melanura* produced signs of neurological disorder in both passages of suckling mice. This isolate from the mice was subsequently forwarded to Dr. Martin Goldfield in the New Jersey State Health Department laboratory where the isolate was identified as Western encephalitis. Other pools of mosquitoes that were collected at the same time but were negative included *Cs. inornata, Coquillettidia perturbans, Aedes canadensis, Ae. trivittatus, Ae. vexans, Anopheles punctipennis* and *Culex* spp.

Isolates of Western encephalitis from *Cs. melanura* east of the Mississippi have previously been considered epidemiologically insignificant. However, this isolate of Western encephalitis in Pennsylvania and other isolates throughout the Middle Atlantic States are particularly ominous at this time, since the vector of Western encephalitis has apparently become established in New Jersey and is widespread throughout Ohio. Dr. Wayne Crans of Rutgers University, (personal communication) has identified *Cx. tarsalis* from 5 locations in New Jersey, and Margaret Parsons (personal communication), Medical Entomologist, Ohio State Health Department has found *Cx. tarsalis* throughout Ohio. Western encephalitis virus in the eastern United States may take on a new significance with establishment of the vector, *Cx. tarsalis.*

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DEER HOOFPRINTS AS OVIPOSITION SITES FOR *AEDES SOLLICITANS* IN LOUISIANA COASTAL MARSH

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Horsfall (1956) stated that depressions in salt marsh areas just above the level of normal high tides were attractive as breeding sites for the salt marsh mosquito, *Aedes sollicitans* (Walker). Recently, Meek and Olson (1976) showed that tire tracks and hoofprints of cattle were among the most attractive oviposition sites for *Psorophora columbiae* (Dyar and Knab) that occurred in Texas ricelands. Recent surveys of the deer population on Rockefeller Wildlife Refuge, Cameron Parish, Louisiana showed there was an average of 1 deer/40 hectare on the 32,000 hectares contained within the refuge. Deer hoofprints in the Louisiana coastal marsh impoundment areas were collected in soil samples to determine if they serve as oviposition sites for *Ae. sollicitans.*

MATERIALS AND METHODS. Soil samples of deer hoofprints were randomly collected in fresh and brackish water impoundments on Rockefeller Wildlife Refuge. All soil surrounding and within each hoofprint was completely removed with the aid of a mortar trowel, placed in individual plastic bags, and transported to the laboratory. These samples were then processed by a modification of the egg separating device described by Horsfall (1956) and Meek (1975) to initially separate the *Ae. sollicitans* eggs from each soil sample. The remaining residue which contained the eggs was then subjected to a salt flotation process described by Horsfall (1956) and Meek (1975). The eggs were then keyed to the species level with the use of a stereomicroscope and the taxonomic keys developed by Ross and Horsfall (1965). A total of 38 hoofprints was collected: 14 each from an intermediate marsh impoundment and a brackish marsh pumpout, 6 from a brackish marsh impoundment and 4 from a natural salt marsh area.

RESULTS AND DISCUSSION. An average of 12.9 *Ae. sollicitans* eggs was collected per soil sample per collection date, with the range from 2-28 eggs per sample. This agrees with data of Meek and Olson (1976) in which they reported similar numbers of *Ps. columbiae* eggs in cattle hoofprints. The soil in these depressions tended to hold moisture longer than the flat open areas and also afforded the gravid female some protection from physical factors, such as wind, during the process of oviposition. Meek (1975) reported that the moisture content of the soil was important in the choice of an oviposition site by a gravid female, *Ps. columbiae.* If these depressions held moisture longer than the surrounding areas, oviposition in these hoofprints would continue over a longer period of time resulting in a larger accumulation of eggs than would normally be collected from a similar size soil sample from the surrounding area.

The average number of eggs per deer hoofprint sample (12.9) was similar to the mean number of *Ae. sollicitans* eggs collected from soil samples containing *Distichlis spicata* (L) Greene (12.13 eggs/sample/collection date) as reported by Fleetwood et al. (1978) which indicated that soil depressions such as deer hoofprints were as attractive to *Ae. sollicitans* for ovipositional sites as the most preferred plant habitats sampled.