OPERATIONAL AND SCIENTIFIC NOTES

POTENTIAL USE OF SCRAP EXPANDED POLYSTYRENE BEADS FOR THE CONTROL OF *AEDES TRISERIATUS*

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ABSTRACT. The potential use of expanded polystyrene (EPS) beads for control of *Aedes triseriatus* was tested in the laboratory and the field. Laboratory studies showed that beads present in amounts which persisted throughout a season significantly reduced the emergence of *Ae. triseriatus* adults by preventing normal eclosion from the pupae. In the field, tree holes containing EPS beads had significantly fewer larvae present than untreated controls. These field data suggest that EPS beads may mechanically prevent oviposition by mosquitoes.

Reiter (1978) suggested using expanded polystyrene (EPS) beads to control the breeding of mosquitoes. The beads float on the water surface preventing oviposition and also make atmospheric oxygen inaccessible to larvae and pupae. In field trials, he later showed that the emergence of *Culex quinquefasciatus* Say from pit latrines could be greatly reduced by the application of EPS beads (Reiter 1985). The use of EPS beads for mosquito control has been recently reviewed by Curtis et al. (1990).

We tested EPS beads for the control of *Aedes triseriatus* (Say), a tree hole species that is the primary vector of La Crosse encephalitis virus in the upper midwestern United States (DeFoliart et al. 1986). If effective, the beads could offer a cheap alternative to insecticide treatment or tree hole closure. They float on the surface of the water in the tree hole and would not be subject to cracking as are pipe cement and sand/cement combinations. These 2 methods of tree hole closure have been suggested as ways of reducing *Ae. triseriatus* breeding (Scholl and DeFoliart 1979, Garry and DeFoliart 1975).

Assays were conducted with scrap EPS beads obtained from the Cellox Corporation, Reedsburg, WI. In the laboratory, *Ae. triseriatus* pupal mortality was determined using EPS beads covering the surface of dental cups (6.5 cm diam) containing 150 ml of distilled water. The water surface of the treatment cups was then treated with a single layer of EPS beads or a layer 3–4 beads thick (ca. 1 cm). In 4 replicates, a layer 3–4 beads thick prevented the emergence of all *Ae. triseriatus* pupae. In 10 replicates, a single layer of beads reduced emergence to a mean of 5.3 adults compared with a mean of 9.8 adults emerging from control cages. A *t*-test showed this to be a significant reduction ($P < 0.001$). This reduction in emergence was not the result of lack of air as suggested by Reiter (1978), but complete eclosion of the adult mosquito was prevented.

Field evaluation took place from June 10 to September 5, 1986, in a second growth oak (*Quercus alba* Linn.) woodlot in Iowa County, WI. Nine water-filled tree holes were selected for the study. Five tree holes were treated with EPS beads and 4 served as controls. Mosquito larvae were sampled fortnightly from both the treated and control tree holes. A 250-ml water sample was removed from each tree hole using a turkey baster and was returned to the laboratory for examination. The condition of the beads was visually examined each week. Although EPS beads were placed in tree holes in a layer 7–10 beads thick, most beads had disappeared within 2 wk. Heavy rains washed them away, leaving

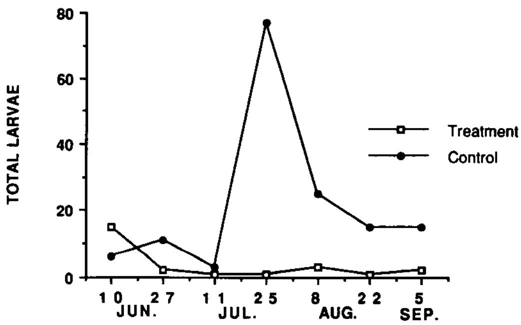

Fig. 1. Total larvae recovered from tree holes treated with EPS beads and larvae recovered from untreated controls.

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only a single layer of beads that adhered to each other and remained for the rest of the study period. Figure 1 shows that tree holes treated with EPS beads had significantly fewer larvae (t-test, $P < 0.05$) than tree holes that were not treated. Both the laboratory and field data suggest that the presence of EPS beads in the breeding site interferes with the production of *Ae. triseriatus*.

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