SCIENTIFIC NOTES 1278 9

PERSISTENCE AND DISPERSAL OF *STEMPELLIA MILLERI* (MICROSPORIDA: NOSEMATIDAE), A PROTOZOAN PARASITE OF *CULEX PIPIENS QUINQUEFASCIATUS*[1]

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Stempellia milleri, a microsporidian parasite of *Culex pipiens quinquefasciatus* Say, was recently described (Hazard and Fukuda, 1974). Several studies were conducted to determine if the parasite could be introduced into an uninfected mosquito population, if it would persist long enough to become established, and if the adult mosquitoes readily disperse the parasite to new locations.

METHODS. An isolated population of the host mosquito in Harris County, Texas, was observed to be negative for *S. milleri* by examination of larval samples at several intervals. On March 22, 1971, several thousand field-collected larvae including many infected ones were poured into the site which was fed by sewage effluent.

A second test was designed to determine establishment, persistence and adult dispersal of the parasite in an isolated, newly established population of this mosquito. The test was conducted on an overgrown, abandoned parking lot at the Coastal Environmental Center of the University of Houston, Hitchcock, Texas. Initial mosquito introductions were made from our laboratory colony of *C. p. quinquefasciatus*. Plastic tubs (39 cm in diameter) filled to a depth of 13 centimeters with water were used for larval developmental sites, and rabbit ration was provided for larval food. Only wild animals were available as a blood meal source for adults. Two tubs were placed in a central location, and a tub was placed at 10 and 50 meters from the central tubs along each of the four cardinal axes. On March 10, 1972, first instar larvae were introduced into each container. One week later (day zero) *S. milleri* spores from mascerated, infected larvae and uninfected larvae were introduced into the central tubs. On day 31 shades were provided for all of the pools except one of the central tubs to minimize algal growth, and to lower evaporation and mid-day temperatures up to 30° C. Small numbers of larvae from the containers were examined 6 times at intervals of 7 to 19 days. Ten or more potentially infected larvae were microscopically examined from each sample.

RESULTS. After dispensing infected mosquitoes into a naturally occurring parasite-free mosquito population, many parasitized larvae were found 58 days later. Unfortunately the larval habitat dried shortly thereafter. Many subsequent mosquito collections during the following year were negative for *S. milleri*, although other Microsporida were found in other mosquito species that were present in the same habitat.

A mosquito population was successfully established in the remote study area. Egg rafts were laid in each larval container indicating acceptability of each tub as an oviposition site. Infected larvae were found 11 days after parasite introduction into the central tubs. Each inspection revealed infected larvae in the shaded central pool including day 72, after which the project was terminated. Some larvae from the unshaded central pool were infected during the first few collections. A collection on day 46 and subsequent collections from this pool were negative for the parasite. An algal bloom and higher temperatures persisted in this pool, resulting in a declining larval population as it became a less preferred oviposition site, and probably a poorer larval habitat. Examination of larvae from the containers surrounding the central pools revealed only one positive larva from the tub 10 meters east of the central tubs on day 55.

DISCUSSION. *S. milleri* was established for a short period of time in the natural mosquito population, but apparently did not survive drying during the summer. The parasite survived in the artificial mosquito population for more than 2 months.

Evidence accumulated thus far indicates that this parasite is not transmitted by infected or contaminated eggs (Hazard and Fukuda, 1974). Non-aquatic dispersal could occur when an infected adult dies on the water surface of an uninfested larval habitat. It is evident that this type of dispersal would be poor at best, and would require much time. Most short-range parasite dispersal in roadside ditches is probably through the aquatic medium.

ACKNOWLEDGMENTS. The authors wish to express their appreciation to Mr. W. L. Barrett, Jr. and Mr. R. J. Bentley, formerly of, and Mr. R. E. Bartnett of the Harris County Mosquito Control District.

Literature Cited

Hazard, E. and T. Fukuda. 1974. *Stempellia milleri* sp. n. in the mosquito *Culex pipiens quinquefasciatus* Say. J. Protozool. 4:497–504.

[1] This investigation, supported in part by U.S. Public Health Service Traineeship Number PHS 5A03AH516–02, was a portion of a dissertation submitted to the University of Texas School of Public Health, Houston, Texas, December 1972, for partial fulfillment of requirements for Doctor of Philosophy degree.

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