BLACK FLY REARING AND RESEARCH AT THE UNIVERSITY OF GEORGIA, USA

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ABSTRACT

The University of Georgia (UGA) Entomology Department is home to an active, innovative and diverse black fly research program. The core of this research program is the world’s only known, reproductively isolated colony of black flies, *Simulium vittatum* Zetterstedt cytospecies IS-7. The colony is operated using the Cornell Automated System as developed by Dr. Ed Cupp and his staff at Cornell University. This system incorporates a closed-circulation trough system in which water is pumped over a wooden runway creating ideal larval habitat. Each week ~ 200-300,000 larvae are produced.

The colony is operated with associated systems that automatically feed the larvae, capture emerging adults and provide suitable substrates for oviposition. Larval feeding is accomplished by grinding a 1:1 mixture of rabbit chow and soybean meal and washing it through a 53 micron sieve. The resulting food slurry is stored in tanks that are kept in modified refrigerators adjacent to the rearing units. Each tank includes two submersible pumps, one to stir the food solution and one to pump it into the rearing unit. Larval development occurs on the wooden runway (0.3 m. x 1.2 m.).

Upon significant pupation, an emergence hood is placed over the rearing unit to capture emerging adults and initiate the mating process. Adults move towards the light coming through the glass funnel located at the apex of the hood and the associated piece of Tygon® tubing that is attached. Mating occurs in this emergence tube and a smaller mating tube where all adults that have been collected during the day are confined. Adults are provided 10% sucrose and distilled water via cotton pads that are placed on the screened portion of the adult container.

The oviposition process is initiated the following week when the adults are removed from refrigeration and egg development is allowed to resume. After 24 hours, adults are released into insect cages (0.3 m. x 0.3 m. x 0.3 m.) that are situated over discs of cloth (0.15 m. diameter, light green) which are bathed in a film of water pumped from 38 liter aquariums via submersible pumps and a tubing apparatus. The insect cages are covered with black cloth, so the only light available is from below the discs. Females are attracted to the moisture and light, and lay their eggs on the moist, discs of cloth. Egg sheets are pinned to the upper surface of a clean runway and the rearing cycle continues.

Eighteen to twenty day old larvae produced in this system are used in an orbital shaker bioassay for a variety of research purposes. The orbital shaker bioassay consists of 250 ml, flat bottom, extraction flasks filled with test water, larvae and serial dilutions of Bti products. The primary operation of this system is for product development testing and research with the commercial black fly control product, Vectobac® 12AS. Testing has included larval feeding studies, component evaluations, product comparisons and algal/efficacy evaluations. This project is graciously supported by Valent BioSciences.