

INSECT *Info*

Entomology Toward a Better Tomorrow

Mosquito-Borne Disease in Illinois

During the last outbreak of St. Louis encephalitis, Illinois led the nation with 578 cases and 47 deaths due to the virus. La Crosse encephalitis occurs annually in Illinois and is a particular threat to children. Infected children frequently suffer mental and physical complications. Waste tires are excellent breeding grounds for those mosquitoes that can cause disease. Tire transport moves native and non-native mosquitoes into and throughout Illinois, with Chicago acting as a high-risk gateway for these introductions.

Challenge

Illinois has over 60 species of mosquitoes that differ greatly in where they're found and what they do. Two important challenges for mosquito research and control are sampling and identifying these mosquitoes.



Response

Sampling and identifying mosquitoes are basic tools for assessing mosquito control strategies and understanding the complex interaction between mosquito life histories and the transmission of disease agents. Our program seeks to improve methods for monitoring, collecting, and identifying mosquitoes and the viruses they transmit. Its primary objectives are to

- Develop, compare, and enhance mosquito collection techniques;
- Implement various sampling methods to determine seasonal changes in the populations and distribution of Illinois mosquitoes and;
- Develop and use molecular techniques to distinguish between mosquito species.

Overnight catch of mosquitoes in sampling device. Mosquitoes will be separated by species and checked for virus identification.

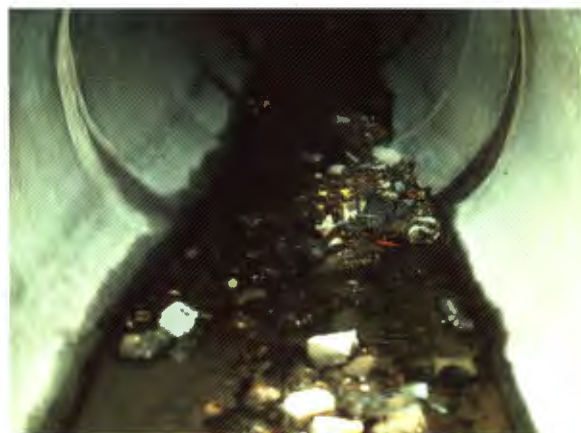


Accomplishments

1. Studied what attracts container-breeding mosquitoes to egg-laying sites, leading to better and more consistent lures for mosquitoes that can transmit diseases in Illinois.
2. Saved Illinois mosquito control agencies time and money by comparing new commercial sampling products and attractants and proving that many were ineffective for use in the state.
3. Found that urban stormwater tunnels are important shelters for mosquitoes that can transmit St. Louis encephalitis.
4. Used the Champaign-Urbana Encephalitis Prevention Program, formed in cooperation with our program, as a proving ground for new sampling and disease-detection technologies.
5. Developed molecular detection techniques, such as polymerase chain reaction and DNA "fingerprinting," to rapidly identify mosquito species associated with St. Louis encephalitis and La Crosse encephalitis viruses.
6. Fielded teams to collect mosquitoes and assess disease risk in over 30 Illinois cities during the flood of 1993 in cooperation with the Illinois Department of Public Health and the Centers for Disease Control.
7. Verified the assay for St. Louis encephalitis in a large-scale trial. Experimentally used the test to search for the virus in several Illinois communities.



Gravid traps collect mosquitoes and their eggs for virus identification.



Urban stormwater tunnel: mosquito habitat.

Impact

Molecular technology is an ethical alternative to the use of wildlife in disease detection, and can be applied to the detection of other native and introduced viruses. This technology provides the essential tools necessary for forecasting outbreaks of mosquito-borne disease.

Our improved sampling technology for mosquitoes that affect humans now allows us to address many of the key issues surrounding mosquito-borne diseases in Illinois. Our research on the collection and identification of adult mosquitoes associated with St. Louis encephalitis and La Crosse encephalitis viruses is an essential service to programs that protect public health and the quality of life in Illinois.

Who We Are



ILLINOIS
NATURAL
HISTORY
SURVEY



College of Agricultural,
Consumer and
Environmental Sciences

The Illinois Natural History Survey is the largest and one of the oldest organizations of its kind in the nation. The Survey studies the animal and plant life of the state to determine the most effective means of protecting and intelligently using these resources for the maximum economic, educational, and recreational benefits of all Illinois citizens.

The Survey, now a division of the Illinois Department of Natural Resources, is headquartered on the campus of the University of Illinois at Urbana-Champaign. The Survey consists of four scientific units: the Center for Economic Entomology, the Center for Aquatic Ecology, the Center for Biodiversity, and the Center for Wildlife Ecology.

The role of insects and how they impact the state has been studied since the Survey's inception. The Center for Economic Entomology serves the citizens of Illinois by investigating and resolving entomologically related issues in four sectors: agriculture, medicine, the environment, and the urban setting. The Center is jointly funded through the Survey; the University of Illinois' College of Agriculture, Consumer, and Environmental Sciences; and the Office of Research/Agricultural Experiment Station. In addition to research, the Center for Economic Entomology provides educational outreach and other types of public service activities.

