

THE PERSPECTIVE OF *Aedes albopictus* FROM THE ADMINISTRATIVE VIEWPOINT¹

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ABSTRACT. Mosquito control administrators should consider a newly introduced species in view of local conditions. *Aedes albopictus* was discovered in Harris County while surveying for *Aedes aegypti*. Recognizing a potential threat to public health, local and state officials were notified of the discovery. Questions posed by the introduction of a foreign species requires a cooperative application of research resources. The Centers for Disease Control (CDC) should serve as the coordinator of this effort.

The perspective of a mosquito control director is determined by considerations of the local physical and political environments. Mosquito control districts in the United States have been formed in response to local concerns regarding past epidemics of mosquito-borne disease or of mosquito nuisance problems which adversely affect the economy and well being of the community. Individual districts, because of the historical and localized interests, will have varied and different responses to problems such as the introduction of a new species. An administrator may recognize the potential health threat both nationally and internationally caused by the introduction of a vector species such as *Aedes albopictus* (Skuse), but will be forced to address specific questions as to how that relates to local public welfare. These questions will influence budgetary decisions affecting control programs which could ultimately benefit local residents.

The Harris County Mosquito Control District was formed in 1965 in response to the St. Louis encephalitis virus epidemic of 1964. The original Advisory Commission of the District recommended a policy standard to the Harris County Commissioner's Court. The policy states that the primary responsibility of the District is to provide disease vector control. The primary target of the District as a result of St. Louis encephalitis is the local vector of that virus, *Culex quinquefasciatus* (Say). *Culex quinquefasciatus* is a rather cosmopolitan breeder with highly varied habitats. Studies conducted by the Harris County Mosquito Control District since 1979 indicate that the major problem is in the underground storm sewer system, plus additional larval habitats comprising roadside ditches, ponds and a wide variety of artificial containers including discarded tires. *Culex quinquefasciatus* develops in the underground storm sewer pipes which have varied uneven-

ness due to soil contraction, expansion and subsidence.

The Harris County Mosquito Control District is unusual in several ways. First, the prime target species is a vector mosquito rather than a nuisance species. Second, the District has a stated policy against the use of organochlorine, organophosphate or carbamate insecticides as larvicides with the exception of DDVP resin strips and temephos with careful monitoring. This policy was formulated out of concern for the environment and the protection against the premature selection of insecticide tolerant strains of mosquitoes.

The prevalence of other vector species such as *Aedes aegypti* (Linn.) in Harris County has been of lesser concern. Nevertheless, since *Aedes aegypti* is a known vector of dengue and yellow-fever, we consider it important to monitor populations in the event either disease became introduced into the Houston area. At one time we submitted ovitrap strips to the CDC in Atlanta for identification. However, we are not sure at this time if the first introduction was made into Houston, or whether it occurred in some other city in the United States or in a Caribbean country and then was brought into Houston.

When I was informed of the introduction and confirmation of *Aedes albopictus* in Harris County, I notified the Harris County Commissioner's Court, the local health officers and the Texas State Department of Health. We knew that this might become a national issue and we were looking for what we could effectively do about it. The program was not designed to conduct the type of inspection needed and work required to eliminate the artificial containers even though they play a role in the *Culex* problem. Although we believe *Aedes albopictus* is replacing *Aedes aegypti* in artificial containers, we have not seen a great increase in the total number of mosquitoes. If, as some scientists postulate, *Aedes albopictus* is a good efficient vector of dengue, but *Aedes aegypti* is the mosquito that selects a strong strain of virus for epidemic transmission, then

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it may be better in our particular area to have *Aedes aegypti* replaced by *Aedes albopictus*. Time and scientific study will be able to answer all of the questions that an introduction of a foreign species brings to mind. We believe that the CDC should be heavily involved in a cooperative program with projects such as ours to obtain the needed answers. Although CDC has taken initiative, the entomologists who can do what is needed appear limited by the emphasis of other programs in their own organization. Regardless of the reasons for this, I believe that we need more emphasis on the field/laboratory entomology effort of CDC.

We are currently trying to answer many of the questions posed by these circumstances. We have just completed a "windshield" survey of an area of the city where a 1980 survey found over 2,000 used tire dumps. In 1986 we counted about one-tenth that number, a significant reduction. We have been instrumental in working with the City of Houston in the development of a tire hauling and storage ordinance which is apparently beginning to show good results. Houston requested that we provide them with a copy of the sites where we recently found tire dumps so that they can take additional action. The public information provided to the local news media is partly responsible for the instigation of the calls being made to the city requesting that they take action on tire dumps. An important consideration in removing tires is how to dispose of them. In Houston many used tire dealers are grinding up tires for other uses. On April 1, 1986, a new tire facility capable of grinding up 3,000 tires per hour started operation, and is not charging for disposal since they are selling the rubber for a fuel source. The tire dumps are now beginning to call the piles of used tires "inventory." Competition may even require that the grinding plants purchase or haul tires to their plants as the large stockpiles disappear and particularly if the demand for this fuel source increases.

We are not panicked, but we do recognize that this introduction has the potential for disastrous results if *Aedes albopictus* will serve also as an efficient vector of yellow fever, California encephalitis, St. Louis encephalitis, or other arboviral diseases. While the potential exists, we do not have sufficient scientific studies of this mosquito at this time to be able

to definitely state the total implications to the District, the state, or the country. The potential for the hemisphere may be far more serious than that for the country, particularly if *Aedes albopictus* can serve to connect the sylvan and urban disease problems.

We are now studying local storage and distribution of scrap tires, control methods, types of breeding habitats, trapping methods, autogeny and the general biology of the mosquito. Current personnel and equipment are being utilized as much as we can without endangering our encephalitis surveillance and control program.

We would like to acquire research funds to enhance our efforts as this mosquito is not just a local problem requiring that Harris County carry the major part of the burden. We believe that this is of importance to the United States and the Pan American countries and that the funding should reflect that importance. Whether CDC or Congress funds the needed studies, it is necessary that action be taken as soon as possible to avoid the transmission of disease by these mosquitoes. If that is not possible, we need answers available to help control or limit disease transmission.

I firmly believe that much needs to be learned about the mosquito, and that CDC needs to coordinate the studies being done. There should be as little duplication of effort as possible to obtain different research goals. Competition for publications should be put aside in favor of coordinated efforts which will provide more answers sooner. My personal agenda would be for research funds to be made available through federal action in order to expedite the answers to the following problems.

1. Current distribution in the United States.
2. Current distribution in the Americas.
3. The genetic source of the introduced strain.
4. Insecticide resistance studies.
5. Control recommendations.
6. Legal recommendations.
7. Vector competency with local arboviruses.
8. Ecological and ethological studies.

In the meantime, the Harris County Mosquito Control District will continue the research already started by its technical and research staff.