

THE RELATIONSHIP OF LABORATORY COLONIES TO THE *Aedes Aegypti* ERADICATION PROGRAM

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The yellow fever mosquito, *Aedes aegypti* (L.), has a long history of use as a convenient laboratory subject for a wide variety of research experiments and teaching demonstrations. Due to its medical importance and ease of laboratory rearing, extensive knowledge has been accumulated on the physiology, genetics, and ecology of this mosquito. Many strains of the species, presently under laboratory cultivation, display wide variation in response to insecticides and are extensively employed in studies of resistance problems and the testing of new compounds or techniques for improved control, as well as routine bioassay for the detection of pesticides in various materials. The accumulated knowledge of the species makes it an increasingly popular subject for both applied and basic research. Such investigations may result in more effective methods for eradication with accompanying reduction in costs.

At the Tenth Annual Meeting of the Entomological Society of America, a resolution was passed providing that a committee be appointed to ". . . devise plans and proposals for the protection of laboratory research colonies of *Aedes aegypti* compatible with nation-wide eradication. . . ." The resolution did not specify how it is possible both to protect and eradicate, but it did reflect a sincere concern over future research with this species.

The campaign for eradication of *Ae. aegypti* is just starting. In 1964, field operations will be limited to the Virgin Islands plus parts of Puerto Rico, Florida and Texas. The *Aedes aegypti* Eradication Branch is now more concerned

with plans for supply, recruitment and training than it is with the possible regulation of laboratory colonies. The present discussion is not a statement of Public Health Service policy but is intended to dispel any misconceptions that may prevent an objective examination of the relationship of laboratory colonies to the eradication program.

Although originally introduced into the United States, *Ae. aegypti* has been a widely distributed resident for many years and consequently, there has been little concern over accidental release of the species from the numerous laboratory colonies. Organizations with colonies of *Ae. aegypti* have been generous in supplying eggs to almost anyone who requested them. The present number and location of *Ae. aegypti* colonies is unknown, and there is little information on the locations where bioassay tests are performed utilizing eggs supplied from other locations.

Federal expenditures required for eradication are estimated at over fifty million dollars. If we add the expected contributions from other organizations, the final cost may reach one hundred million dollars. At present it does not appear reasonable to advocate the immediate elimination of colonies that are established in areas outside of eradication operations. It does seem certain that as the area of operations is extended, as the investment in eradication becomes greater, and as the prospect of eradication increases, the concern over any possible source of reinfestation will also increase.

National and international commitments to eradication of *Ae. aegypti* from the Americas will require all precautions that may be necessary to avoid any chance of accidental reinfestation from laboratory cultures. Perhaps these precautions will include the discontinuance of routine

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use of *Ae. aegypti* for bioassay tests and the elimination of all laboratory colonies. There will be a more immediate need for restrictions on colonies located in the eradication area (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, South Carolina, Texas, Puerto Rico and Virgin Islands), and possibly in other places where either active infestations in nature are found on future inspections or where the climatic conditions favor survival of such natural infestations.

It is certain that some regulation of *Ae. aegypti* colonies must replace the present unrestricted use of the species as a laboratory subject. If there is to be a desirable period of transition, directors of research may wish to give early consideration to the following suggestions:

1. Plan to employ species other than

Ae. aegypti on future research projects.

2. Discontinue the use of *Ae. aegypti* for fish food, for lecture demonstrations, and for bioassay.
3. Organizations with colonies of *Ae. aegypti* are urged to:
 - a. Restrict shipment or transfer of the species to qualified researchers who presently maintain the species.
 - b. Review insectary procedures to decrease the hazard of accidental release.
 - c. Review current research to determine if objectives may be reached by phasing out investigations with *Ae. aegypti* and substituting indigenous species such as *Aedes triseriatus* (Say) or *Psorophora varipes* (Coquillett).

THE AFRICAN *Aedes aegypti*

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Although sound in its principle, the concept of eradication is bound to encounter some problems in its application. For instance, in Leopoldville (former Belgian Congo) despite the use of powerful means of action, we had been unable to eradicate *Aedes aegypti* on a city-wide basis whereas some South American nations had succeeded on a nation-wide basis. Nevertheless we had been able to eradicate from the city limits such species as *Simulium damnosum* or even *Anopheles gambiae*, of which, for instance, an annual average of only 3 positive breeding places were found between 1955 and 1959 and only at the point of reinvasion, at the outskirts of the city close to the shoals of the river. During the same

period, on the other hand, we had an average of 320 positive breeding places for *Aedes aegypti*; for a city of 400,000 inhabitants in which about 1,200,000 houses and premises were visited each year. It was not too poor an "*Aedes aegypti* index." But anyway, this still was a threshold under which we seemed unable to go. Why?

Is there any vital potentiality of the complex *Aedes*-environment which lends itself to eradication of the species in one place and not in another place? We started diligent search for an answer to this problem, but, unfortunately, the subsequent political events precluded any further research in this specific area. It is only recently that it has been possible to come to some reasonable understanding of the situation as observed in Africa versus the situation as observed in the Americas.

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