A Note of Caution for the Proper Storage of WHO Larval Mosquito Test Kits

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The need for exercising care in storing World Health Organization Larval Mosquito Test Kits and others containing ethyl alcohol (ethanol) was pointed up in a recent laboratory analysis of such materials which had given unusual reactions in routine tests on *Aedes aegypti* larvae at the Public Health Service Quarantine Station, Miami, Florida. The unusual effect of the insecticidal solutions and the ethanol control materials on larvae, coupled with moderately violent reaction when test materials were added to water, suggested abnormal test solutions. Biological tests of the ethanol solutions at the Technical Development Laboratories, Communicable Disease Center, Public Health Service, Savannah, Georgia, revealed that 49 to 74 percent mortality occurred in *aegypti* larvae held in the control solution for 24 hours. Chemical analysis of the same solutions indicated that they contained a concentration of approximately 0.6 percent naphthalene.

In many entomological laboratories, various insecticides are kept in rooms or storage cabinets in close proximity to one another. We found that during the temporary storage of the test kits in Washington, D. C., and in Miami, Florida, prior to their use, they were kept near small supplies of naphthalene flakes. However, they were stored in the unopened packages as received from WHO, with the sealed (polyethylene) plastic bottles containing 50 ml. solutions of DDT, BHC, and/or dieldrin, respectively, along with the control bottles of ethanol. Of course, it is possible that contamination of the ethanol occurred before the kits were received by the Public Health Service.

In subsequent biological tests, the Miami Quarantine Station also noted that paradichlorobenzene fumes can penetrate the sealed plastic bottles. It, too, is readily absorbed by the ethanol solutions. Paradichlorobenzene-contaminated ethanol solutions produced a more violent reaction than the naphthalene-contaminated material.

In view of the adverse effects of naphthalene- and paradichlorobenzene-contaminated solutions on mosquito larvae, it is important that storage of WHO Larval Mosquito Test Kits near these and possibly other chemicals be avoided as long as the test materials are kept in penetrable plastic containers.

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Do Low-Level Jet Streams Affect Mosquito Flights?

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Meteorologists have described nighttime horizontal warm air currents that reach maximum velocities from 50 to 80 miles per hour between elevations of 800 to 2,000 feet. These thin layers of high speed air occurred at night when there was very much less wind above and practically none below at ground level. Are these nocturnal jet streams a factor in the migration of mosquitoes? People engaged in mosquito control may well give some thought to this question.

The general features of the low-level jets were described by Dr. Morton L. Barad in the August 1961 issue of the "Scientific American," (Vol. 205, No. 2). The studies were by the Air Force Cambridge Research Laboratories.

The jets are essentially local phenomena being most common over the flat terrain of the Great Plains and less likely in mountainous areas. On nights when they occur they begin about nightfall and gradually increase in speed to a maximum about midnight. Then there is a gradual decline until the movement ceases about dawn. The jets may sometimes be 1,000 miles long and from 40 or 50 to 500 miles wide. Meteorologists think the buildup of a jet is assisted by temperature inversion. On the nights when jets develop, the depth of the inversion layer increases after sunset, the temperature increasing up through the first thousand feet or so. The fastest winds in the core of the jet are just above the top of the deepening inversion. The direction of the low-level jet is toward the north. This direction swings several degrees toward the east during the night.

There have been many accounts of mosquito migrations when warm night winds prevailed and reached ground level. At Bakersfield, California a different type of air phenomenon is reported to have effected migration. The possibility that low-level jets may be another factor in mosquito migration seems worth examining. Do the exodus flights of mosquitoes from areas of heavy production bring them involuntarily into the path of low-level jets? Does the cold air at ground level during inversion encourage mosquitoes to seek the warmer air several hundred feet above, and thus within jet range? Are mosquitoes capable of detecting low-level jets and deliberately seeking them out for travel purposes?

Until meteorologists have more comprehensive surveys of low-level jets and such information becomes available in weather reports it may be difficult to correlate with mosquito migrations. However, mosquito control people alerted to the possible effect of these jets may be able to pick up evidence of mosquito migration relating to the phenomena.