

as a registered trade name for a specific commercial product, which has not happened yet.

STANDARD PREPARATIONS. It is normal practice to bioassay both commercial and experimental products against internationally accepted standard products, which permits a description of potency in terms of international units. A succession of standard powders, IPS78, IPS80 and IPS82 has been produced for the *israelensis* variety, each powder consecutively replacing its predecessor. For other varieties, products numbered E61, HD-1, etc., have been used. These products form unique series, with numbers different from—and not to be confused with—numbers used for serotypes, strains or isolates (Table 1).

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LABORATORY OBSERVATIONS ON SOME FRESHWATER VERTEBRATES AND SEVERAL SALINE FISHES EXPOSED TO A MONOMOLECULAR ORGANIC SURFACE FILM (ISA-20E)

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Several mosquito species have been tested against the monomolecular organic surface film Arosurf 66-E₂ (ISA-20E) from the Sherex Chemical Company, to determine the percentage of kill (LD50 or LC90) of the film on these species, but work has just begun on non-target species associated with mosquito habitats. We evaluated the effects of this mono-oil on the fresh-water green tree frog, *Hyla cinerea* (Hylidae) and on the two fresh-water fishes, *Hypostomus plecostomus* Loricariidae and *Gambusia affinis* Baird and Girard (Poeciliidae). We also tested the following saline fish species with ISA-20E under aerated conditions: *Fundulus confluentus* Goode and Bean, *Fundulus grandis* Baird and Girard and *Cyprinodon variegatus* Lacepede (Cyprinodontidae), *Poecilia latipinna* Lesueur (Poeciliidae) and *Dormitator maculatus* Bloch (Eleotridae).

Early in September 1981, the three freshwater individuals were placed in an office aquarium containing conditioned tap water at

varied room temperatures and photoperiods. After a week, the monomolecular surface film was added at an equivalent to 0.68 ml/m² to the 10 gal (45 liter) fish tank. For the next 6 months (September 1981–February 1982) the specimens were observed and fed. The mono-oil surface was maintained.

The green tree frog progressed normally from tadpole to adult and the two fish survived and developed normally.

Based on our observations of these three freshwater species, exposed to the mono-oil film for 6 mo, we determined that the ISA-20E had no detrimental effect.

Fish were collected from the salt marsh in unbaited barrel minnows traps and with dip nets. Salinity readings were taken and ranged from 20 to 44%. The fish were left overnight in the aquarium room in their own water.

The aquarium lab is an insulated, converted, 10 × 20 foot, storage building with a 12,000 BTU fully automated heat-cool air conditioner.

The room contains a two light bank system, one overhead and one over each aquarium. Timers allow for staggered lighting somewhat simulating sunrise-sunset. An air pump sustains 75 to 100 aquaria.

Two 15 gal (68 liter) tanks were used (0.3 × 0.6 m); one was the treatment tank and the other was the control tank. The water was a mixture of conditioned tap water mixed with aquarium salt (Instant Ocean®) and trace elements to equal 42% in the control tank. The tanks were aerated by air stones throughout the test. The following equipment was used for recording water quality; dissolved O₂ meter, YSI, model, 51B; American Optical Salinity Refractor; and Marine Master pH test kit.

A test was conducted with four *Fundulus confluentus* (two males and two females), one *Fundulus grandis*, five *Cyprinodon variegatus*, four *Poecilia latipinna* (two males and two females) and one *Dormitator maculatus* on February 22,

1982, after allowing the fish one wk to become acclimated. Matched specimens were placed in the control tank and in the treatment tank, which was treated with ISA-20E at the rate of 0.68ml/m², a dosage higher than recommended for field use.

After 168 hours of treatment with ISA-20E at a dosage of 0.68ml/m², there was no mortality in the five species of saline fish and no significant differences were detected in water quality in the test and control tanks either before treatment or after the 168 hr of the test.

None of the freshwater vertebrates nor the saline fishes exposed to the monomolecular organic surface film showed detrimental effects.

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ANOPHELES CRUCIANS: A NEW ADULT RECORD FROM MICHIGAN

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An outbreak of Eastern equine encephalomyelitis (EEE) in southwestern Michigan during the summer of 1980 (D. B. Francy 1980, personal communication) led to subsequent mosquito surveys in 1981 and 1982. Mosquitoes were collected under the direction of H. D. Newson, Department of Entomology, Michigan State University. Specimens were sent on dry ice to the Division of Vector-Borne Viral Diseases, Centers for Disease Control, Fort Collins, Colorado, where they were identified to species and tested for virus.

Two adult female *Anopheles crucians* Wiedemann were recovered from a CO₂-baited CDC light trap collection near Three Rivers, St. Joseph County, on the evening of July 12, 1982. The trap site was a swampy area, populated with young trees and adjacent to a small stand of conifers.

The only record of *An. crucians* from Michigan prior to this date was based on larvae taken in Midland County and reported by Newson et al. (1975), Cassani and Newson (1980), and Darsie and Ward (1981). The presence of two female specimens in the 1982 collection from St. Joseph County constitutes a new adult rec-

ord for the state. Since it has been reported from Wisconsin, Illinois, Indiana and Ohio (Darsie and Ward 1981), it is not surprising that it occurs also in Michigan.

The specimens have been compared with the descriptions in Howard, Dyar and Knab (1917) and Carpenter and LaCasse (1955) and found to be the same. As an adult, *An. crucians* is indistinguishable from *An. bradleyi* and *An. georgianus*, although they may be separated in larval and pupal stages (Floore et al. 1976). Since the distributions of the latter two species are geographically remote from southwestern Michigan, the identification of the two specimens as *An. crucians* was made with confidence. The specimens were not tested for virus so that they could be retained for taxonomic purposes in the reference collection at the Centers for Disease Control, Fort Collins, Colorado.

Eastern equine encephalitis virus has been isolated from *An. crucians* in Georgia, Louisiana, Alabama and Florida (Floore et al. 1976). It is unlikely, however, that this species played an active role in the Michigan outbreak, since it is apparently rare and because Chamberlain et al. (1954) rated its vector potential for EEE as poor