large 10 gallon tank was installed with an electric fuel pump. This allowed continuous operation for a full night's fogging, thus eliminating the need to carry extra gasoline. It also eliminated the need for the operator to try to fill a small tank from a portable gas can. It was found that a lot of gas was spilled on the hot engine during this night refueling operation causing a fire hazard.

2. The engine exhaust pipe was re-directed to the side of the vehicle, thus eliminating the exhaust being aimed at the truck cab. It was found that slow driving would allow the exhaust to enter the cab when the small window ventilators were open.

3. The rubber seals in the insecticide exhaust nozzles were replaced with teflon seals. It was found that the malathion used caused the rubber seals to expand and thus allow an air/insecticide mixture to escape.

4. The bolts and nuts were removed from the black pump and low pressure switch cover and the holes were tapped with ¼×20 threads thus eliminating the nuts. It was found that it was a very tedious job to remove the cover when the nuts were used on the bolts.

5. The flush tanks on 3 of our units developed leaks in the tubing at the bottom of the tanks. The tanks were removed and the tubing was expanded with heat to allow a better fit of the small tubing on the large connection. A small hose clamp was installed. After a season's use it was also found that the sun expanded the tank so that it was impossible to remove it from the holding bracket. The only way to remove the tank is to cut the holding bracket from the top rim down to the top of the viewing slot; thus allowing the aluminum holder to expand.

6. A small section was removed from the belt cover screen to allow an RPM rotary indicator to be inserted on the engine drive pulley in order to check for proper RPM of the engine.

7. The plexiglas cover on the air pressure gauge clouds up when malathion is used in the machine, thus causing it to be unreadable. A glass cover replacing the plexiglas, eliminates the problem.

8. It was found that a number of times the pump by-pass switch would be turned to the "on" position inadvertently. A small hole was drilled in the switch allowing it to be wired to the off position with a light wire, that can be broken or removed when use of the pump by-pass is necessary.

9. The battery was removed from the unit and placed in a plastic battery box with a cover, thus eliminating the possibility of electrical arcing especially during refueling operations.

10. In order to accommodate 2 different insecticides, 2 tanks were installed and the three-way valve was replaced with a four-way valve, which used the same location and mounting holes.

11. The digital control head was found to hinder the driver's vision if mounted on the dash, therefore the ashtray was removed on our Ford Couriers and the unit was mounted in its space below the dash.

It was found that the above modifications were minor in nature, but ones that made for more efficient operator use of the equipment and easier maintenance.

THE OCCURRENCE OF *AEDES ATROPALPUS* (COQUILLETT) BREEDING IN TIRES IN OHIO AND INDIANA

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The rockhole mosquito, *Aedes (Ochlerotatus) atropalpus* (Coquillett), has an unusual distribution (Figure 1). Zavortink (1972) listed records from southern Quebec in Canada, the eastern United States from Maine to Alabama and Georgia, and the northern midwest from northeastern Minnesota, northern Wisconsin, and northern Michigan. Siverly (1972) stated that there were no records of *Ae. atropalpus* from Illinois, Indiana, Kentucky, or Ohio, but suggested that since it had been reported from Michigan, it could possibly be found in Indiana. Covell and Brownell (1979) reported finding this species breeding in tires in Jefferson County, Kentucky. In 1979, personnel from the St. Joseph County Mosquito Abatement Program, University of Notre Dame (UND), and the Vector-borne Disease Unit, Ohio Department of Health (VBDU), found this species breeding in tires in Indiana and Ohio. These collections bring the total number of mosquito species occurring in Indiana to 52 and in Ohio to 53.

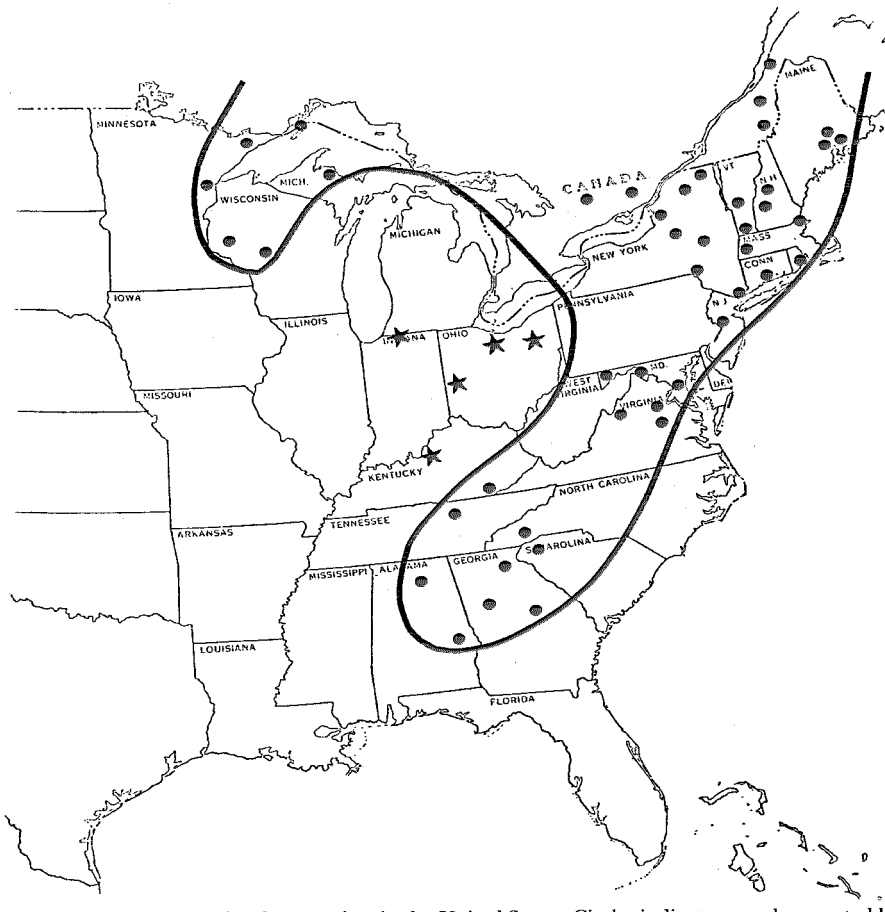

Fig. 1. Distribution of *Aedes atropalpus* in the United States. Circles indicate records reported by Zavortink (1972). Stars indicate subsequent discoveries in Kentucky (Covell and Brownell, 1979), Ohio and Indiana.

There was a possibility that specimens found were *Ae. epactius* (Dyar and Knab), a container breeder as well as a rockpool breeder. The Indiana and Ohio populations exhibited behavioral characteristics of both *Ae. atropalpus* and *Ae. epactius*. The identification of these populations as *Ae. atropalpus*, as opposed to *Ae. epactius*, is based on morphological features of the larvae (color of antennae and head capsule, the number of comb scales, the sclerotization at the base of the siphon, and the development of seta 1-M), the male genitalia, and isozyme analysis (Munstermann 1980). However, the blood-feeding behavior and breeding site preference of these populations are similar to *Ae. epactius* in that, although they are autogenous, they readily feed on humans, even shortly after emergence, and they readily utilize con-

tainers as breeding sites. Populations of *Ae. atropalpus* prefer rockpools almost exclusively and are entirely autogenous for the first gonotrophic cycle, after which they may take a blood meal.

The following are the records of adult and larval collections for Ohio and Indiana. Adults were collected in light traps or mechanical aspirators during bite and shelter collections.

Summit County, Barberton, Ohio: The first collection was of 8 adult females on July 13, 1972. Twenty-nine more females were collected in 1972, 94 in 1975, 88 in 1976, 19 in 1977, and 3 in 1979.

Huron County, Norwalk and Willard, Ohio: Two adult females were collected on July 6, 1977, in Norwalk, and 1 female on August 29, 1977, in Willard.

Darke County, Greenville, Ohio: One adult female and 1 fourth-instar larva were collected on July 9, 1979, at a tire distribution and repair company. Ninety-one adults and several hundred larvae were collected during 4 visits (July 9, August 13, September 17 and 18, and October 2, 1979). Cohabiting the tires with *Ae. atropalpus* were *Ae. triseriatus* (Say), *Anopheles barberi* Coquillett, *An. punctipennis* (Say), *Culex pipiens* (Linneaus), *Cx. restuans* Theobald, *Cx. salinarius* Coquillett, *Cx. territans* Walker, *Orthopodomyia alba* (Baker) and *Or. signifera* (Coquillett).

St. Joseph County, South Bend, Indiana: Fourteen larvae were collected on July 17, 1979, from discarded tires in an auto salvage yard. Return visits on August 9 and August 20, 1979 yielded 2 and 7 *Ae. atropalpus* larvae, respectively. Cohabiting these tires were *Ae. triseriatus* and *Cx. pipiens*. At a second site approximately 0.5 km from the first, 6 larvae of *Ae. atropalpus* were taken from discarded tires, along with a number of *Ae. triseriatus, Cx. restuans,* and *Cx. territans*.

Voucher specimens of both adults and larvae discussed in this report have been deposited in both the VBDU reference collection and in the UND collection.

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AN ADULT EMERGENCE TRAP FOR USE IN SMALL SHALLOW PONDS

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A large variety of traps for emerging adult mosquitoes has been devised (Service 1976). The standard type for obtaining quantitative estimates of population size or density has been some sort of conical or box trap, either floating (Mundie 1956) or attached to the substrate (Corbet 1965), and from which mosquitoes are removed by a collecting jar on top, or by aspiration, or both. However, our experience with this type of trap has been that, no matter what material the trap is made from (metal, cloth, nylon screen), mosquitoes tend to remain in the cone and do not enter the collecting jar. Furthermore, aspiration of mosquitoes out of the trap is too time-consuming when one is dealing with the number of traps required to adequately sample even a small pond for population estimates. Therefore we have developed a modification of the standard cone trap, in which the cone is the collecting part of the trap and is removed entirely and replaced on each sampling occasion.

The frame for the trap (Fig. 1) consists of a circular, aluminum alloy rim, 25 cm in diameter, the position of which can be adjusted on a 1 m long stainless steel spike. The conical nylon net bag has an elastic base which fits tightly over the rim. The spike is pushed into the