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A SIMPLE, PRACTICAL METHOD OF COLLECTING SAMPLES OF *Anopheles sergenti* MOSQUITOES IN A CAVE WITH THE AID OF A STANDARD MOSQUITO CAGE

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At Neot Kikar, a new settlement in the southernmost part of the Dead Sea area in Israel, large numbers of *A. sergenti* tended to penetrate during daytime into caves, crevices and fissures of limestone rocks, concentrating there on and between stones and pebbles. It is very hard to collect them from these places by means of the usual aspirator. Sucking by mouth is inconvenient and involves loss of time as well as the danger in inhalation of dust and small particles of the limestone walls.

These difficulties can be overcome by mechanical sucking (see *Mosquito News*, 23:4, 351) and by following the simplified method described below.

A mosquito cage with nylon or muslin netting and a wooden frame of 20 x 20 x 18 cms. was introduced in the afternoon, inside or close to the opening of a crevice of the cave, where many mosquitoes used to congregate, in a dim corner which was free of draft. The sleeve of the cage was left wide open. Mosquitoes entered the cage to hide, and then settled in it.

Early the following morning the sleeve was closed quickly, thus catching the mosquitoes inside. By this simple method we frequently succeeded in collecting more than 100 adults in one operation without any effort.

On November 10, 1962, when the temperature had dropped to 11° C. and a few drops of rain—so rare in this area—had fallen, we were able to catch 21 females, all with blood, inside the cage, while only a few mosquitoes were seen outside the cage.

Our observations showed that *A. sergenti* are very sensitive to meteorological conditions and change their resting places several times, even during daytime, under the influence of changes in temperature, humidity, lighting and draft conditions.

On May 28, 1964, between 2 and 5 p.m., we were able to collect with much difficulty 39 adults with the aid of an aspirator. Finally we put a cage of 30 x 30 x 30 cms. in a spot near the opening of the main crevice. After two hours only, at about 7 p.m., we closed the sleeve and found that we had caught an additional 30 adults in this cage.

The method has proved to be simple and useful.

Aedes MOSQUITOES FEEDING ON TURTLES IN NATURE

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Considerable attention has been given in recent years to reptiles as possible overwintering hosts of arboviruses in nature. Gebhardt *et al.* (1964) demonstrated the maintenance of western equine encephalitis virus in wild snakes during the winter months. In New Jersey Goldfield and Sussman (1964) found turtles naturally infected with both eastern and western equine encephalitis viruses. They reported the isolation of EEE virus from the brain of a snapping turtle and the isolation of WEE virus from the blood of both northern diamond-back terrapin and box turtle. Hemagglutination-inhibition (HAI) antibodies to EEE virus (but not to WEE virus) were found in the blood of a box turtle in southern Maryland in 1964 (Yuill, 1965).

Since mosquitoes play a significant role in the dissemination of disease agents, observations on their feeding on reptiles or other hosts appear important. Investigations on mosquito-borne viruses are in progress in Pocomoke Cypress Swamp near Pocomoke City in Worcester County, Maryland. This brief note describes two observations made in early 1964 near Pocomoke Cypress Swamp on *Aedes canadensis* (Theobald) and *Aedes triseriatus* (Say) biting turtles.

On June 12 we saw a painted turtle, *Chrysemys picta* (Schneider), moving across the paved road from the fresh water swamp toward a cultivated field. At a distance the body of the turtle appeared to be entirely covered with mosquitoes, while others were flying about either in pursuit or departing towards the woods. As we approached the turtle, it stopped momentarily but soon continued on its course. When closely observed, mosquitoes were seen resting on the dorsum of the carapace, the head, neck and legs, undisturbed by the turtle's movement. Some mosquitoes were found probing through the skin, while two had their abdomens distended with apparently freshly ingested blood.

With a hand aspirator we followed the turtle in attempts to collect some if not all mosquitoes present. We collected 38 females, of which 37 were *Aedes canadensis* and one *Aedes triseriatus*. Four days later, a similar incident occurred in the general vicinity involving a box turtle, *Terrapene carolina* (Linnaeus). In this case six mosquitoes were collected from the turtle. These were identified as *Aedes canadensis*. It is interesting that

these were the only two species observed feeding on turtles among ten species collected in the swamp at that time of the year. The other eight species were, *Culex salinarius, Culiseta melanura, Aedes sollicitans, Aedes taeniorhynchus, Aedes vexans, Anopheles punctipennis* and *Anopheles* sp. (*bradleyi-crucians* complex).

No mention was found in the literature on *Aedes triseriatus* feeding on turtles in nature. This species is known as a persistent biter on a wide range of animals (Wallis, 1960) and man (Masters, 1962). However, *Aedes canadensis* was previously reported by Carpenter (1941) to feed on cold blooded animals including turtles, though no reference to a specific observation was stated. This species was also reported by Hayes (1961) as feeding on three species of caged turtles (eastern box turtle, eastern painted turtle and eastern spotted turtle) in Massachusetts.

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GYNANDROMORPHISM IN *Culex erythrothorax* (DYAR)

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A gynandromorph was found in a laboratory colony of *Culex erythrothorax,* maintained at the Sixth U. S. Army Medical Laboratory, Fort Baker, California. It emerged on 22 January 1964 and was killed and preserved eight days later. The specimen has the following pertinent characteristics: typical female antennae, palpi and proboscis and typical male genitalia.

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NOTES ON SOME LABORATORY-REARED *Culiseta melanura* (COQUILLETT)

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On August 7, 1964, a number of first instar larvae of *Culiseta melanura* (Coquillett) were collected in the Pocomoke Cypress Swamp, Worcester County, Maryland. These larvae were taken to Washington, D.C. and reared to the adult stage in our insectary. This paper describes some points of difference between our experience with *C. melanura* and reports of previous workers (Wallis, 1954; Chamberlain, Sudia and Nelson, 1955; Siverly and Schoof, 1962).

The larvae were collected from beneath a dead pine tree, which in falling had lodged at about 60° with the horizontal. The shallow roots of this tree had lifted the litter and duff on the side opposite its direction of fall. No opening to the crypt so formed could be found, but probing established that it extended below the level of ground water, which was perhaps a foot beneath the surface. A small entrance was made by digging and the larvae were collected blindly with a dipper. The crypt was perfectly dark and only its deepest part contained water.

The larvae were reared at 27° C. in 6 x 26 x 41 cm. cloth-covered white enameled pans with 15 hours artificial daylight, dawn and dusk. The original swamp water was replenished with tap water as required by evaporation; each pan was fortified with a pinch of dog food in the 4th, 10th and 15th weeks.

The larval medium was darkly colored with tannins and contained the rot of leaves, twigs and rootlets. It supported—in addition to mosquito larvae—populations of *Cyclops* and larval hydrophilids. The light, grayish, iridescent scum which formed on the surface of the pan was removed at intervals.

There were some 15 mosquito larvae per pan. Larval growth was homogeneous, all larvae attaining the fourth instar at approximately the same time. However, the larval period was inordinately long, and adult emergence occurred in two discrete waves (Table 1). These conditions have not been reported by previous authors. No larval or pupal mortality was detected.

The adult mosquitoes were hardy, yet passive. They survived well on apple slices and/or 4 percent sucrose-soaked cotton pads. The females could not be induced to feed on chick or mouse by 24-hour starvation or by low temperature (21° C.) with concurrent starvation for 16 hours. They will, however, gorge on blood-soaked cotton pledgets, in the absence of other foods, (Siverly and Schoof, 1962). In our trials, mosquitoes given 4 percent sucrose-96 percent heparinized chick blood ingested only serum, since the two

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