

## A Note on Colonization of *Culex*

K. S. KRISHNAN<sup>1</sup>

In India, colonies of *Culex pipiens fatigans* and *Culex bitaeniorhynchus*<sup>2</sup> have thus far been established successfully in the laboratories of the National Institute of Communicable Diseases (formerly Malaria Institute of India). Mosquitos from these colonies are used in studies on disease transmission, insecticides, resistance and bionomics.

### CULEX PIPIENS FATIGANS

The colony was started with the eggs obtained from wild-caught females.

#### Colony cage

The cage is of wooden framework measuring 2×2×2 feet (60×60×60 cm). Three of its sides are fitted with fibre-board. The top is covered with a plywood board having a central opening, 2 inches (5 cm) square, blocked with fine-mesh wire gauze. The upper half of the front portion is glass-covered, and the lower half is of fine wire netting having a central cloth sleeve.

#### Rearing

A bird (house sparrow, *Passer domesticus*; bulbul, *Pycnonotus leucogenys*; or chicken) was confined in a wire cage, and was introduced every night into the colony cage to provide a blood meal for the female mosquitos. The males were provided with 10% glucose solution on soaked cotton-wool pads. At times raisins were also used.

For obtaining egg rafts, enamel bowls or Petri dishes with water were put inside the cage. The egg rafts that were laid were removed each morning and transferred to enamel basins (40 cm diameter) or to earthen ones, for hatching. Five to six egg rafts were introduced into each basin. Generally the larvae were fed on dried yeast powder, but on occasion

they were also reared on hay infusion. The latter was prepared by soaking hay in water for about 48 hours. The pupae were pipetted out twice during the day as they formed. They were collected into bowls and were allowed to hatch in 12×12×12-inch (30×30×30 cm) cloth cages. The adults that hatched were used for the various needs as required. The parent colony was also replenished at times with these adults.

The temperature and relative humidity in the insectary room were maintained at 26°-20°C and 70%-80% respectively. At first there were no set temperature and humidity controls, the required conditions being obtained by using electric room heaters to raise the temperature during winter months, while in hot months ice blocks were kept in the room to bring down the temperature. However, in recent years room coolers have been fitted. Humidity was formerly maintained by hanging wet cloth sheets and keeping large trays of water in the insectary, but room humidifiers have recently been installed.

The gonotrophic cycle in existing temperature and humidity conditions took about four to six days. The life cycle usually took 9-14 days. It was observed that during cold months the time taken was a little longer.

#### Some observations made in the course of maintenance of the colony

Given identical conditions, more egg rafts were obtained in trays containing hay infusion than those with ordinary tap water.

Overcrowding of larvae in rearing pans decreased the percentages of emergence and pupation. Adults obtained from such pupae weighed less than those bred normally. Females from under-populated pans had a higher biting rate (Krishnan et al., 1959).

House sparrows (*Passer domesticus*) were found more suitable than rabbits as hosts for female *C. p. fatigans*. A larger proportion of the females fed and more egg rafts were obtained when sparrows were used. However, there is one disadvantage in

<sup>1</sup> Assistant Director (Entomology), National Malaria Eradication Programme, Delhi, India.

<sup>2</sup> The *C. bitaeniorhynchus* colony was maintained in the Coonoor branch of the National Institute of Communicable Diseases.

using these birds: some of them harbour natural trypanosome infections, the parasites being picked up by *C. p. fatigans* while feeding, and further development taking place in the insect host (Jaswant Singh et al., 1950; David & Nair, 1955).

For rapid separation of large numbers of pupae from cultures, Krishnamurthy et al.<sup>1</sup> adopted a novel technique. When ice-cold water was poured into larval pans, the larvae sank to the bottom while the pupae remained at the surface. The pupae were then separated with the help of a cloth net.

There has been no difficulty in colonizing *C. p. fatigans* at any stage in the laboratory. Even in small cages this species mates, feeds and lays eggs. At times it was observed that there was some reluctance on the part of the females to feed in a big cage, but if they were transferred to small cages they fed readily.

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<sup>1</sup> Krishnamurthy, B. S., Roy, S. N. & Joshi, G. C. (1963) *A note on preliminary field studies of the use of irradiated males for reduction of C. fatigans Wied. populations* (unpublished working document WHO/EBL/6).

#### CULEX BITAENIORHYNCHUS

Mohan (1950) successfully established a colony of *Culex bitaeniorhynchus* for use in transmission experiments.

The following are Mohan's observations.

The colony cage used for colonization was similar to the one described under *C. p. fatigans*.

The females obtained blood meals from rabbits. Eggs were laid only when green algae were introduced into the ovipositing bowls.

For rearing larvae it was essential to have green algae in their basins. Fresh algae ensured the growth of larvae and kept their mortality low, and the adults produced were robust.

The females fed on the second day after emergence, a single blood meal being sufficient for full maturation of ova. A higher percentage of the females fed on glucose solution than on rabbits, when both were provided in the colony cage.

Under caged conditions, such activities of the adult as swarming, feeding and oviposition were not well marked.

#### REFERENCES

- David, A. & Nair, C. P. (1955) *Indian J. Malar.*, **9**, 95-98  
 Jaswant Singh, Ramakrishnan, S. P. & David, A. (1950) *Indian J. Malar.*, **4**, 189-192  
 Krishnan, K. S., Bhatnagar, V. N. & Raghavan, N. G. S. (1959) *Bull. nat. Soc. India Malar.*, **7**, 131-132  
 Mohan, B. N. (1950) *Indian J. Malar.*, **4**, 167-173