

## ADULT

### EFFECTS OF LARVAL NURTURE ON ADULT CHARACTERISTICS AT EMERGENCE AND SURVIVAL WITHOUT FURTHER NOURISHMENT

Maximum expression of size, body weight, and energy reserves (Table 8) is present in the adults at emergence when *Cx. nigripalpus* larvae are reared in the laboratory under ideal environmental conditions, with maximum quantity of food, and with either a low larval density or temporary crowding in fresh water at a constant temperature of 27°C (Nayar 1968b, Nayar & Sauerman 1970b). A combination of low food quantity, constant high larval density, and high salinity produces adults with a minimum of size and weight (Table 8). Both size and weight also vary inversely with the temperature, since larger and heavier adults are produced at lower temperatures than at higher temperatures (Nayar 1968b). At emergence, differences in size and weight between male and female *Cx. nigripalpus* are slight (Table 8) when compared to other mosquito species, where these differences are pronounced (cf. Nayar 1969, Nayar & Sauerman 1970b).

Starving 4th instar larvae for varying time periods prior to pupation produced adults of similar size but varying body weights and energy reserves (Table 9), thus indicating that both are continually accumulated during the last stages of 4th instar and up to pupation. Therefore in nature, if the amount of food available to the 4th instar was diluted by rainfall or depleted by overcrowded conditions, the resulting adults would be lower in weight and have less energy reserves. This became apparent when the survival of the emerging adults was observed. When larvae were not starved during the 4th instar, the 50% survival time of the newly emerged adults was normal (91 to 93 hours, Table 9), but as the starvation period of the larvae was increased, their 50% survival time as adults was greatly reduced (66 to 72 hours, Table 9). Survival time was dependent on the amount of lipid present in the adult at emergence, but was not affected by the amount of glycogen. Approximately 35% of the dry body weight at emergence was lost by the time 50% survival time was reached, whereas the lipid and glycogen reserves were reduced by 79% to 95% of their original amount. Therefore, with advancing age, unfed adults became exhausted and died due to a depletion of their reserves.

A direct correlation between the depletion of lipid and 50% survival time was established when *Cx. nigripalpus* larvae were reared on specific diets and then analyzed as adults at either 12- or 24-hour intervals for any depletion of their energy reserves (Nayar & Pierce 1977). The glycogen and triglyceride reserves declined exponentially, i.e., the depletion (utilization) rate of both glycogen and triglyceride was proportional to the amount of each that was present at emergence. The rate of utilization was between 50% and 74% for each 24 hour period, but utilization decreased as the mosquito aged. A 90% depletion of the triglyc-