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TSETSE RESEARCH PROJECT TANGA
RESULTS OF RABBIT HOST COLONY EXPERIMENTS

PASA RA-1-00 Res
PN-RAA-568

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1974

1. INTRODUCTION:

Tests on a rabbit fed *Glossina morsitans* fly colony were started by Dr. Offori at Tanga on March 16, 1974. The tests were and are still done in the Pupae Holding room fitted with an air conditioner, two humidifiers and a hygrothermograph. These tests were started with 300 flies fed on 8 lop-eared rabbits sent from Vienna, Austria. Two staff members and Dr. Offori carried out the tests. Dr. Offori was sent as a consultant from International Atomic Energy Agency, Vienna, Austria.

2. TESTS:

One of the early tests done was as follows:-
Feeding newly emerged flies. On the first day, 350 newly emerged females from field collected pupae were divided into two groups each containing 300 and 50 flies. The first mentioned group was fed on two rabbits and after feeding the number of fed flies was counted. The last group was left for a control. The following day both groups were checked to see how many died and the mortality was calculated. The procedure was continued everyday with new flies for 20 days. It was found that there was little difference in mortality between flies fed on day of emergence or next day. However, we feel it is useful to offer flies a blood meal on the day of emergence to give them the best possible conditions.

When Dr. Offori left for Vienna, Austria in April, 1974 the two staff members continued the work until the writer arrived back from Bristol, England on May 18, 1974. It was found that the staff members who continued the work kept on adding new flies to the old flies and that caused much confusion as far as keeping records is concerned. Hence, this colony was taken into the record system used by our laboratory for goat colonies and prior records and system were abandoned on June 11, 1974.

Early in June we also began using 8 New Zealand white rabbits from Nairobi, Kenya. We used 3 rabbits each day for feeding the flies. The flies are left on the ears for 10 minutes. We found that the New Zealand white rabbits ears to be small and flies had difficulty to feed. We tried turning the cages on their edges but decided this did not have any special advantages.

Early in July, we decided to record the number of flies being applied to each rabbit as is done in our laboratory. In August we received some more eight lop-eared rabbits from Bristol, England. This increased our stock of rabbits to 22 excluding 3 breeding rabbits and 24 young rabbits. We therefore decided to divide the rabbits into groups A, B and C to be used alternately as with the goats in our laboratory. Three rabbits were put into each group and 2 put aside as spares. We do not use breeding rabbits for feeding the flies.

3. DAILY ROUTINE OF WORK:

At the beginning of each day except Sunday the procedure performed by 3 people is as follows:-

a) Climatic control check: Each morning the temperature and relative humidity are checked. The temperature in the rabbit fed colony is 76°F on average (24.5°C) whereas the relative humidity is 74%. In July the temperature and relative humidity were not constant as they kept changing from day to day until in August when the hygrothermograph was adjusted.

b) Preparation of rabbits: We put the rabbits into the fly feeding room 15-20 minutes before fly feeding starts. The rabbits are put into special boxes and tied with belts.

c) Mortality census: While the rabbits are waiting, the dead flies are removed from the fly cages and recorded. The removal of dead flies is done on Mondays, Wednesdays and Fridays. It is only the female mortality which is calculated. Mortality is expressed as a percentage per day. Cages contain 10 flies each and are placed on trays. Each tray holds 10 cages and so one tray contains 100 flies.

d) Feeding time: After checking mortality, the rabbits ears are placed on special cushions or pillows. We start feeding the females first. Cages containing flies are applied to the rabbits ears for 10 minutes. This is repeated until all flies are fed. The cages are secured on to the rabbits ears by rubber bands and at the same time covered with a piece of a white cloth to prevent any disturbance caused by the movement of the people working in the room. Then we record the number of flies being applied to each rabbit. One rabbit feeds 148 flies each day. As the feeding is going on the newly emerged flies are collected in individual tubes from the emergence cages in which pupae are kept. These teneral or young flies are sexed, put into the cages ready for feeding.

e) Pupal collection: Pupae are collected from the metal chutes put under the trays holding the cages containing females. The chutes contain sterile sand obtained from the laboratory. The pupae are weighed and recorded.

f) Mating: Mating is done at 1 o'clock noon. Two methods are used in mating, namely tube mating and cage mating. Females of day 3 and males of day 10 up to 15 are used for mating. On August 12, 1974 we started using unfed males for mating. We take two cages containing males and females. The male cage is covered with a box and a special tube is put in the male cage with another end into the female cage. By the help of a bright light shining on the female cage the males fly into the female cage ready for mating. The flies stay in there for 19 hours (i.e. from 1 o'clock to 8 o'clock the next morning) after which the dead flies are removed and then separated and put in their respective cages ready for feeding. With this method the males outnumber the females, i.e. when 10 females are to be mated, 15 males will be used. After mating the females are put into the maintenance cages in which they will remain throughout their life. The males used once for mating can be reused after 5-6 days.

With tube mating two flies of different sex (male and female) are put in one tube. The tube is closed with a cover and the flies will remain in there for the period mentioned above.

g) Records: At the end of each day's work we record all the results of the work done. We use card forms and Daily Stock forms. The results recorded include mating, emergence and pupal production.

4. RESULTS:

The performance of the colony is determined by the following factors:

- a) longevity (survival) - number of females alive at end of period
- b) fecundity (production) - number of pupae per female
- c) pupal weight (puparial weight) - a good pupa should weigh 27 milligrams and above. All the above depend on nutrition. The nutrition should be adequate and free from contamination sufficient and the time or duration allowed for feeding the flies should be reasonable.

The rabbit fed colony shows that in July there were 320 females with the daily mortality percentage of 0.89 and the number of pupae per female per month 1.66 whereas in August there were 325 females and the daily mortality percentage was 1.03 and the number of pupae per female per month was 2.15. The results sound comparable and have been graphically shown on the chart. We have intended to keep 500 flies in the colony and all extra flies will go to External II Colony. The rabbits are kept here as alternate hosts for feeding the flies.

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