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PROPOSED IMPROVEMENT FOR REARING GLOSSINA morsitans IN TANGA.

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1974

INTRODUCTION:

I was sent on a technical assistance assignment from IAEA-FAO at the beginning of August 1974 to Tanga. My arrival just fell in a period of progress and we are all looking forward that the recent progress of the project will continue.

The histroy of the project was a very unlucky one and full of difficulties. I am referring to the three reports of progress of Dr. A. M. Jordan and of Dr. E. Offori, pointing out the problems, the project was faced with.

Although fly colonies are expanding, we feel there is considerable chance for improving colony performance such that it would compare more favourably with results in European laboratories.

I have tried during my stay of six weeks in Tanga to make some investigations into causal factors of fluctuation in mortality and fecundity. Besides the fact that flies coming from field collected puparia are not doing so well as mortality and pupae production is concerned, it should be possible to get at least from the more laboratory adapted flies some better results in terms of longevity and pupae production.

TEMPERATURE:

The temperature in the fly holding room was at the beginning of August at about 23.5 - 24°C. This seemed a bit to low as the peak female emergence of three different groups of pupae showed the maximum at 32 to 33 days. So the temperature was reset to about 24.5°C and the next test that ended in September showed a peak emergence of 30 days for the females. The temperature in the fly handling room was around 22°C and the fly feeding room had about 27-28°C. The flies were brought from the holding room into the cold handling room and after being checked for mortality they came into the warmer feeding room. I think that such a change in temperature can effect the fly feeding behavior. The temperature in the handling room is now set to about 24-25°C and the same temperature is arranged in the feeding room.

HUMIDITY:

The humidity in the fly holding room is always around 70% RH. with rather sharp fluctuations due to the fact that the two small defensors being used have a low capacity and cannot cover the loss of humidity during the working period in the laboratory, within a reasonable time. The humidistates have a low sensitivity and are probably the main reason for these fluctuations. On the other hand the system is a rather safe one because of its low humidifying capacity and a recent blocking of one of the two humidistates was followed only by an increase of humidity to about 85% R.H. Two similar accidents at the Seibersdorf laboratories caused heavy losses of flies because of the high efficiancy of the used 'Lumatic' system. Never the less it should be proposed to use a double humidistate system for safety reasons especially when the new defensors are installed.

The rather low fecundity of the Tanga colonies could be due to a bad inseminationsrate of the females, if we exclude other reasons for the moment. The results of the spermathecae dissections showed a good insemination, never the less seemed the mating procedure to need some improvements. So was the use of fed males for the mating changed at the beginning of August and in accordance with other laboratories we are using now males being unfed on the day of mating.

The daily emergence procedure showed that a rather high number of flies are starting to mate in the emergence cage as soon as they are brought into the bright fly handling room. Such a praemating can induce females to refuse a proper second mating without being full inseminated. The use of a chiller would prevent such praematings because of a shorter exponation to the light before sexing. Another help would be the use of only daily lots of pupae per emergence cage. In connection to the praemating it was proposed to set the light intensity in the fly holding room to 90 during the handling period and onto 60 after the handling. As a result the activity of the flies has gone down. This can effect the pupal weight and the longevity of females not breaking their wings to early.

FEEDING PROCEDURE:

The cages being applied to the goats were fixed onto the host by means of two welcroedged canvas strips at the short ends of the cages. The flanks of the Tanga goats are much more convex then in goats from Europe because of the small size of the animals. Thus the canvas strips were conteracting when the cages were fixed on each end and the cages became loose. Especially for goats with had feeding behavior it seems to be esential to get the cages fixed as tight as possible. It was proposed to tighten the cages at about the middle of the long axis of the cage with both canvas strips one on top of the other. Now the two strips are adding up their tension on holding the cages in position.

In the rabbit feeding, the geigy cages were put upright onto the rabbit ears and covered with a cloth. As a result some of the flies were sitting in the farest coruers of the cage without being atrocted towards the rabbit ears because of to long distance and no temperature gradient. The cages now are placed with the big surface part of the cage onto the ears and a better feeding is performed. The results of the rabbit colony now are comparable to other rabbit fed colonies in Europe. So we got for August 2.15p/♀/month and 1.0% daily mortality. This will give about 3.5 times the number of pupae being necessary to maintain a colony. A colony of 50.000 females would produce 35.000 excess pupae per month.

MORTALITY:

The several changes that were instituted to improve fly handling and mating procedure have not resolved periodic fluctuations in mortality. Although the magnitude of these fluctuations is not great (± 0.5%/day), when we see an increase we become concerned and would like to stabilize mortality at the lowest possible level.

Recently two cages containing 2 day old males were discovered in which all 20 flies were dead. We determined the cages to be contaminated. A new lot of flies placed inside these cages died within one day. These cages had not been properly cleaned. We know that materials purchased from shops in town are frequently contaminated with pesticides. For example it was proved that aluminium sheets used as cage covers were contaminated with insecticide.

As a result of these events, we developed a different system for cleaning cages prior to their use. Test were carried out showing that the locally available Teepol detergent does not do any harm to the flies. The cages now are soaked over night in a solution of 5cc Teepol per liter water.

Mortality (Cont'd)--

Afterwards the cages are carefuly rinsed in tap water and dried.

It was found that the chloroform being used on a routine bais for ectoporasite control on goats was contaminated with fly toxicants. The dried residue after the evaporation of 250cc of locally available chloroform was strong enough to kill flies within 4 hours. Such a residue on the goat flankes can contaminate the netting of the cages. Recent washing of the goats after the chloroform treatment, with soapy water and tap water seemed to decrease the mortality in the goat fed colonies rapidly. Never the less it is proposed to stop the chloroform treatment of goats until another agent is found which does not contain insecticide like products.

CAGES:

The cages being used in the moment are not completely satisfying. The frames of the cages often have very sharp edges from the welding process. The size and shape of the frames differ. The netting is streched onto the cages too tightly and most of the cages get holes in the netting within a few days of use. Additional training has been instituted and this matter corrected.

NEW TECHNICAL EQUIPMENT:

A chiller was made and recently installed in the first insectary. Two others are planned. These instruments should greatly increase the efficiency of the fly handling work in the laboratory. A new type of emergence cage similar to the one used in Langford was made.

A simple type of drinker for the rabbits was built. The increase of number of rabbits makes it necessary to get more of these drinkers made.

SYSTEM OF RECORDING:

We are using a 7 day system principally to check our local progress. We will however compute our records such that they can be compared with Bristol and Vienna.

We are aware that recording can become a cumber some and redundant operation in a mass rearing program of this size. We are basically interested in determining our rearing efficiency of G. morsitans in Tanzania and whether it can be economically feasible to produce enough surplus males for sterilization and release. When back up colonies are in full operation in Bristol and Vienna we will be more interested in comparing results.