

Communications

Observations on the effects of antibiotics in the blood meal of *Glossina* species

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AHMED (A.B.), ONYIAH (J.A.). Conséquences des antibiotiques sur le repas de sang de certaines espèces de glossines. *Revue Élev. Méd. vét. Pays trop.*, 1994, 47 (1) : 103-104

Les auteurs rapportent une diminution de la productivité de 2 colonies auto-entretenuës de *Glossina palpalis palpalis* et de *G. tachinoides* maintenues *in vivo* sur des lapins dont l'alimentation comportait 2 antibiotiques : l'oxytétracycline et la salinomycine. La fécondité dans les deux espèces a baissé mais leur non taux de survie. L'examen de leur appareil reproducteur a révélé une proportion élevée de femelles de *G. p. palpalis* dont le cycle de reproduction était moins avancé, en même temps que la présence de quelques anomalies. Au contraire pour *G. tachinoides*, les auteurs ont constaté une dégénérescence profonde des follicules en développement. Une diminution considérable du nombre de mycetocytes a été observée chez *G. tachinoides*, alors que seules des altérations légères étaient visibles chez *G. p. palpalis*. Le remplacement des hôtes nourriciers par des animaux nourris avec un régime sans additifs a entraîné un relèvement de la productivité chez *G. p. palpalis* mais non chez *G. tachinoides*. En conclusion, les auteurs recommandent d'éviter l'emploi des additifs dans le régime alimentaire des animaux utilisés pour nourrir les colonies de glossines, alors qu'un régime composé à partir de produits locaux, soja et maïs, avec adjonction de vitamine C donne d'excellents résultats.

Mots-clés : *Glossina* - Elevage d'insectes - Survie - Performance de reproduction - Alimentation des animaux - Antibiotique - Nigeria.

This communication was initiated following an observation made on the deteriorating reproductive performances of two closed colonies of *Glossina p. palpalis* and *G. tachinoides*. These colonies had been maintained *in vivo* on rabbits since 1986 (5, 6). All efforts to trace the cause of the problem were unsuccessful, until 8 months later when chemical analyses of the commercial pelleted diet were conducted. The results revealed the presence of a mixture of oxytetracycline (Pfizer) and salinomycin at concentrations of 32 and 60 ppm, respectively.

The fecundity of *G. p. palpalis* females had declined with no significant decrease ($P > 0.05$) in the survival rate. The mean puparial weight of 29.2 ± 2.9 mg decreased by 3 ± 0.68 mg. Examination of the reproductive system revealed a high proportion of the females in a less advanced reproductive cycle but with a few ovarian abnormalities. Microscope examination of the mycetomes revealed the existence of mycetocytes with only slight damage. A significant observation was the gradual improvement in both fecundity and puparial weight after the change of hosts to those maintained on additive free diets.

In the case of *G. tachinoides*, the fecundity declined sharply with abortion of a considerable number of larvae. Microscope examination of mycetomes and reproductive

systems showed a reduced number of mycetocytes and a deep degeneration of developing follicles. The observations of a group of 65 fertilised colony females, aged between the II-IV age group period (AGP), produced only 7 puparia in 56 days with a survival rate of 40 %. A change of hosts did not reverse the abnormalities and the colony was eventually lost.

Therefore, it would be reasonable to assume that the antibiotics contained in the diet of the hosts were the source of this problem. Fly sensitivity to even lower concentrations of antibiotics than the one under report has been mentioned (4).

High incidences of abortion and other abnormalities in various tsetse fly species attributable to the presence of additives in the diet of animal hosts have also been reported (2, 7, 9). Whether the effect of these toxicants on the symbionts is specific for different *Glossina* species or that different tsetse species harbour different strains of the bacteroids, is not known. However, from this observation and other reports involving *G. m. morsitans* sub-species and *G. p. palpalis* (1, 3, 8, 9), it appears that *G. p. palpalis* is less susceptible to interference from toxicants than the other tsetse species and sub-species.

This observation further demonstrates that some of the difficulties experienced by tsetse fly breeding laboratories in Africa (those employing the *in vivo* feeding techniques), may be due to the presence of additives in the diets of the hosts since feeds purchased from commercial feed millers are not usually subjected to chemical analyses. Related problems arising are hardly attributed to such diets but to one cause or another, since the animals hosts do not normally show signs of illness.

Conclusion

In order to protect the reproduction of *Glossina* from such interference, the use of additives in the diets of animal hosts for colonies of tsetse flies must be avoided. The cost of procuring additive-free diets is, however, prohibitive. This situation necessitates the search for an alternative diet from local sources. A mixture of roasted coarse ground soya bean and zea mays (1:3 ratio), supplemented with vitamin C give excellent animal performance. Besides being cheaper than commercial products, the uncertainty of toxicants is eliminated.

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Reduced productivity of two self-producing colonies of *Glossina palpalis palpalis* and *G. tachinoides* maintained *in vivo* on rabbits whose diets contained oxytetracycline and salinomycin antibiotics, was observed. Fecundity of both of the species declined, but not their survival rates. Examination of their reproductive systems revealed a high proportion of *G. p. palpalis* females in a less advanced reproductive cycle with few abnormalities, while *G. tachinoides* females showed a deep degeneration of developing follicles. A considerable reduction in the number of mycetocytes of *G. tachinoides* was observed, while *G. p. palpalis* was only slightly damaged. Use of animal hosts on additive-free diets resulted in an improved productivity of *G. p. palpalis*, but not *G. tachinoides*. It is recommended that the use of additives in the diet of animals used for feeding tsetse colonies must be avoided. The attempt to use a locally formulated diet based on soyabeans and zea mays supplemented with vitamin C gave excellent results.

Key words : *Glossina* - Insect rearing - Survival - Reproductive performance - Animal feeding - Antibiotics - Nigeria.

Residual effects of benzyl benzoate parasiticide tested on *Glossina p. palpalis* Robineau Desvoidy (Diptera : Glossinidae)

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AHMED (A.B.), ONYIAH (J.A.). Effets résiduels d'un antiparasitaire, le benzoate de benzyle testé sur *Glossina p. palpalis* Robineau Desvoidy (Diptera : Glossinidae). *Revue Élev. Méd. vét. Pays trop.*, 1994, **47** (1) : 104-106.

Les effets d'un antiparasitaire, le benzoate de benzyle (BP), ont été évalués en laboratoire sur la survie et les performances de reproduction de *Glossina p. palpalis* en utilisant des lapins comme hôtes nourriciers, afin de déterminer la marge de sécurité post-thérapeutique. Aucune des mouches nourries sur les animaux présentés 30 min (groupe A) après l'application du médicament ne s'est alimentée pendant les 2 premiers jours. Dans ce lot, la survie a été médiocre en ce sens que la mortalité a atteint 40 p. 100 au 35^e jour, avec une production totale de pupes de 12. A l'exception d'une légère amélioration de leur réponse alimentaire et de leur fécondité, les performances du lot nourri sur des sujets à 2 et 5 jours (groupes B et C) ont été faibles, et comparables à celles du groupe A. La survie et la productivité des glossines nourries 7 jours après traitement (groupe D) étaient bonnes, mais celles des mouches nourries 14 jours après traitement (groupe E) étaient meilleures et semblables ($p > 0,05$) à celles du groupe témoin. La qualité des pupes produites par les glossines dans les groupes A à C était faible, la moyenne étant de 19,6 + 1,1 mg contre 26,8 + 1,4 mg et 28,1 + 0,9 mg respectivement, chez les glossines des groupes D et E. Ces résultats montrent une amélioration avec le temps de la réponse alimentaire et de la productivité des glossines après application du traitement. Ainsi, il convient d'observer la durée minimale de sécurité de 3 semaines avant de nourrir les glossines sur des animaux traités au benzoate de benzyle sans craindre d'effets résiduels.

Mots clés : *Glossina palpalis palpalis* - Elevage d'insectes - Survie - Performance de reproduction - Antiparasitaire - Lapin - Hôte - Nigeria.

Introduction

Benzyl benzoate BP emulsion (Leady Pharmacy, Nigeria), also known as Ascabiol, is a parasiticide still used in veterinary medical practice for the treatment of sarcoptic or demodectic mange. The morbidity rate due to scabies in the rabbit colony of the Nigerian Institute for Trypanosomiasis Research (NITR), which serves solely to provide hosts for feeding laboratory bred tsetse flies, has been consistently high, a situation that necessitates frequent application of the drug. In the light of this, the present study was conducted to evaluate the effect of the drug on the survival and reproductive performance of the tsetse fly *Glossina palpalis palpalis* with the aim of determining the safety margin post treatment, since the tsetse breeder using the *in vivo* feeding technique is interested in both the health of the animal hosts and the performance of the flies.

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