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Sub-lethal Effect of Sulphaquinoxaline on the Tsetse Fly, *Glossina austeni* Newst

A MARKED fall in fecundity of females of the tsetse fly, *Glossina austeni* Newst, fed on rabbits, was found to be associated with the use of a commercial rabbit diet containing, as a coccidiostat, 75 p.p.m. sulphaquinoxaline and 7.5 p.p.m. pyrimethamine. Contemporary flies fed on goats reproduced normally.

Table 1 Performance of Female *G. austeni* fed on Rabbits Supplied Successively with Various Diets.

	No. ♀♀	% ♀♀ surviving to day 60	No. puparia produced	Mean No. puparia produced per ♀
Diet A	150	86.7	1,362	9.1
Diet B	243	81.5	624	2.6
Diet C	150	72.0	1,295	8.6

Diets: A, Coccidiostat-free; B, 75 p.p.m. sulphaquinoxaline and 7.5 p.p.m. pyrimethamine; C, coccidiostat-free.

The performance of female flies fed on rabbits given the coccidiostat diet (diet B) is compared in Table 1 with the performance of female flies fed on the same rabbits given coccidiostat-free diets before (diet A) and after (diet C) the 3 month period of feeding the treated diet. Although the longevity of all groups of flies was similar, females fed on rabbits

supplied with diet B produced markedly fewer puparia than those fed on the rabbits when supplied with diets A and C. Age-specific fecundity schedules¹ show that the production of puparia by the affected flies was only slightly sub-normal during the first reproductive cycle but that in succeeding reproductive cycles a number of aborted larvae, interspersed with occasional normal larvae, were produced, followed by most females ceasing reproduction.

The observed effect on the fecundity of *G. austeni* is considered to have resulted from the action of sulphaquinoxaline. This, and other sulphonamide compounds, have systemic insecticidal activity against mosquitoes after intraperitoneal administration to the host animal^{2,3}. Single doses of 500 to 540 mg kg⁻¹ of sulphaquinoxaline were required for a 48 h LD₅₀ value. Interference with the synthesis of folate, directly or on a gut symbiont, has been suggested as the mode of action of sulphaquinoxaline under such circumstances⁴. Pyrimethamine alone is inactive as a systemic insecticide⁵.

The effects on haematophagous arthropods resulting from feeding their hosts with concentrations of sulphaquinoxaline as low as 75 p.p.m. do not seem to have been reported, although in one case 330 p.p.m. effected control of northern fowl mite, presumably by killing the mites⁶. In *G. austeni*, 75 p.p.m. was insufficient to cause any increase in mortality but did result in marked interference with the ability of females to produce offspring. The relatively complicated method of reproduction of *Glossina*, adenotrophic viviparity, may be particularly susceptible to interference by very small quantities of such compounds as sulphaquinoxaline but workers maintaining any species of haematophagous arthropod should perhaps guard against the use of coccidiostats in the diet of their host animals.

In exceptional conditions in Africa, *Glossina* spp. have been reported as being virtually dependent on one species of domestic animal, generally cattle^{6,7}, for food. In such circumstances, regular treatment of the hosts with low and acceptable doses of sulphaquinoxaline might have potential for the localized control of *Glossina*.

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Role of Calcium in the Seasonal Modulation of Pacemaker Activity in a Molluscan Neurosecretory Cell

MOLLUSCAN ganglia contain several pacemaker neurones that spontaneously generate slow membrane potential oscillations associated with a burst of spikes during the depolarising phase (bursting pacemaker potential, or BPP)¹⁻⁶. One such neurone,