M. Laird (Ed.): Tse-tse, the future for biological methods in integrated control.

Int. Development Research Centre, Ottawa 1977, 220 pp., 28 Figs., Price $ 8.75.

This perfectly printed, graphically well-organized soft-cover publication summarizes the present state of knowledge on the control of the tse-tse fly and the prospects of the use of biological methods in this control. The urgency of this topic is enhanced by the fact that it has been included in the FAO programme on the eradication of the tse-tse fly in the next 40 years on one hand, and that it figures among the control measures against the sleeping sickness within the WHO Special programme of tropical diseases control on the other. In 15 chapters twenty seven authors give brief accounts of different aspects of the problem and express their views on further possible development of methods for the eradication of *Glossina* flies, mainly on the use of biological control methods. This aspect is of great interest as previous attempts to influence the tse-tse population in nature by releasing parasitic Hymenoptera have not been successful, trapping was almost ineffective and only insecticides in the form of residual spray applied to places of concentration and shelters of the fly could reduce its populations in a decisive way.

Different articles present the results obtained in the recent period of research, the assessment of the yield achieved by particular methods of culturing the tse-tse fly in laboratory and relate the knowledge on parasites and pathogens effective against this fly. The authors discuss the prospects of the role which may be played by parasites colonized on cultured *Glossina* flies as well as by species producible on a large scale on different European blowflies (Calliphoridae). Laboratory experiments showed that not a single current fungus or bacterium used for insect control affected efficiently the tse-tse fly and under laboratory conditions only invasive larvae of the *Neoaplectana* nematode were effective.

It should be borne in mind that despite their great noxiousness tse-tse flies are not numerous in nature and consequently biological preparations applied over large areas will be costly and ineffective. Bacterial infections disclosed during the past years appeared only under abnormal conditions, because they happen during artificial feeding, when bloodsucking is carried out through a membrane and on blood of different sterility from case to case.

So far as future work should be concerned it would be rather necessary to seek routes which make the fly encounter the infections directly. On one hand, these could be caused by mobile parasites which actively look for their victims, on the other — by agents multiplying in the fly's niches and being transmitted there. A transovarial transmission of infection would be ideal, because it perseveres in the subsequent generations and penetrates into any other individuals of the same species, wherever they may occur, reducing their number. Among such transovarial infections might be those caused by viruses, some fungi and various microsporidians. Each of these organisms has a chance to infect the fly, because it will obviously be a man-introduced infection from another host which will adapt to the transovarial transmission and will maintain the threshold of the apparent infection in the wild population.

The usefulness of this book consists in the comprehensive and objective assessment of previous studies, which are cited in an extensive and complete bibliography. The book will be a solid platform for launching subsequent attempts at biological solution of combatting the vector of nagana in cattle and sleeping sickness in man, the two scourges which hamper the development and self-sufficiency of vast territories of Africa.

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