collections are less representative, and in poorer condition than the more extensive collections made in the 1920's and 1930's. It is therefore impossible, at this stage, to determine whether the midge has or has not been introduced to Africa, since the new records presented here will easily fit into a pattern of initial introduction to West Africa, followed by distribution eastwards to the Sudan and then southwards to South Africa.

However, it is obvious that Barnes was correct in suggesting that the sorghum midge might have been overlooked by economic entomologists in Africa.

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Effect of Age and Pregnancy on the Tolerance of Tsetse Flies to Insecticides

IT has been found that, in the laboratory, old female *Glossina morsitans* Westw. show a considerably greater tolerance to some chlorinated hydrocarbon insecticides than do the young flies of both sexes, and in particular that pregnant flies show an exceptional degree of tolerance. Complete log-dosage/probit-mortality regression lines have been determined for dieldrin (Table 1).

Dieldrin was applied in solution in lighting kerosene as a constant volume (0·022 μl.) to the mesothorax of flies which had emerged from wild pupæ and had been given a blood feed the previous day. Pregnant flies were defined somewhat arbitrarily as those more than 50 mgm. in weight at the time of testing, and fertilized flies were those less than 50 mgm. in weight and more than 21 days old. They were a mixture of those insects which were in an early state of pregnancy or had recently larviposited or aborted. All lines were parallel, and all differences given in Table 1 are significant at $P = 0·05$ (ref. 1). Old females also show significantly increased tolerance to DDT and γ-BHC, but males do not develop tolerance as they age. These tests have been extended to *G. swynnertoni* Aust. caught as wild adults, and pregnant females were found to be nine times as tolerant as males to DDT.

That breeding females are up to nine times as tolerant as young flies is of obvious practical significance. In a recent paper, Yeo and Simpson[2] have given a theoretical forecast of the final results to be expected from repeated applications of a non-residual insecticide to wild tsetse populations, basing their calculations on a constant kill attained at each application. The kill is usually assessed from catches of males, and for the first one or two applications, of females. They discuss the results of a number of experiments in aerial control. The apparent kill for both sexes is normally more than 90 per cent, that for males being the higher, but the final reduction at the end of the experiment is frequently consistent with a kill of about 60 per cent[2]. It is suggested that this is because the major part of the measured mortality falls on young flies, the old breeding females escaping. These form a small proportion of catches because the mean life of wild females is only 1–2 months[3] and because they come most readily to man when young[4]. Thus a high kill may be recorded without any great reduction in the breeding population. This will, of course, fall as the old flies die from natural hazards, but the result will be to delay the expected reduction in breeding and increase the value of the later applications above that assigned by Yeo and Simpson's analysis. It is also necessary to re-examine the conclusion that an inter-treatment interval close to the pupal period is the best. At the appropriate season in Central Tanganyika, the mean temperature is about 24° C.[5], the pupal period about 31 days and the mean age at deposition of the first larva 23 days[6]. Thus by the end of the third week of life the female fly is pregnant and tolerant of insecticide. This means that, with an inter-application interval of 4 weeks[2], all females emerging in the week after an application are potentially tolerant of the next.

A second consideration concerns tests for insecticidal resistance. For these, care must be taken to test only males or females of known age.

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Increase in Distribution of *Deraeocoris olivaceus*

THE study of animal introductions and their fate provides an object lesson in ecology[1]. Some, as the leafhopper *Graphocephala coccinea*, become permanent elements of the British fauna; others, as the tingid *Stephanitis rhododendri*, achieve an initial spread but later contract; still others, such as the rhopalid *Liorhyssus hyalinus*, can do no more than maintain an occasional very temporary colony in Britain. The present communication concerns a conspicuous mirid bug, *Deraeocoris olivaceus*, which it is timely to map after a space of ten years. It occurs on *Crataegus* (hawthorn), usually becomes adult during July, and is collected by beating; its biology is known in broad outline[2].

Table 1. TOXICITY DATA FOR *G. morsitans* TO WHICH DIELDRIN WAS APPLIED TOPICALLY IN KEROSENE SOLUTION. 72 HR. MORTALITY, CORRECTED FOR CONTROLS (REF. 7)

Sample	Mean age (days)	Mean weight (mgm.)	LD_{50} (μgm.) and 95 per cent fid. limits		Ratio and 95 per cent fid. limits	
Young males*	4	29·2 ± 3·1	0·0017	0·0013–0·0022	1	
Fertilized females	32	43·3	0·0065	0·005 –0·0085	3·8	2·6– 5·6
Pregnant females	35	56·6	0·016	0·012 –0·021	9·4	6·4–13·8

* Young females of this batch were not tested, but in other batches there was no significant sexual difference in susceptibility (ref. 8).