

## Dieldrin-resistance in *Cimex hemipterus* Fabricius in the Pare Area of North-East Tanganyika

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The tropical bed-bug, *Cimex hemipterus* Fabricius, has been found resistant to DDT in many countries (Busvine<sup>a</sup>) and to gamma-BHC in Israel (Cwilich, Mer & Meron<sup>b</sup>), but as far as is known, no report on resistance to dieldrin has previously been published. The findings described in the present note are from the Pare area of North-East Tanganyika, where an experiment is in progress to find out whether or not malaria can be controlled by residual treatment of huts with dieldrin. A water-dispersible powder was used at an approximate wall dosage of dieldrin of 80 mg per square foot (860 mg per m<sup>2</sup>) during the first cycle, completed in November 1955. Subsequent treatments were carried out, at 8-month intervals, using half the above dosage. Beds were sprayed as well as the interior surfaces of the huts.

**Field observations.** The first cycle of dieldrin treatment was immediately successful against bed-bugs, and no nuisance was reported after the second cycle, in June 1956. The Africans in the locality stated that nuisance from bugs recurred about the same time as the third cycle of treatment, in January 1957. The results of examination of beds in the Pare area for the presence of living adult or nymphal bugs are given below.

<i>Time of examination</i>	<i>Number of beds examined</i>	<i>Number of beds infested</i>
August 1955 (before residual treatment) . . . . .	100	71
November 1955 (one week after first treatment) . .	94	5
June 1957 (five months after third treatment) . . .	106	91
October 1957 (one week after fourth treatment) . .	108	86

It is concluded that bed-bug nuisance reappeared between 14 and 19 months after residual spraying began.

**Laboratory tests.** The method used to test the susceptibility of the bed-bugs is similar to that described by Busvine.<sup>c</sup> Filter-papers, 11 cm in diameter, were impregnated with solutions of insecticide in Risella oil, using the technique of Busvine & Nash,<sup>d</sup> and inserted into test-tubes. Ten adult bugs, of mixed sexes, were added to each tube, which was then sealed with a thick pad of cotton wool, and mortalities were recorded after seven

<sup>a</sup> Busvine, J. R. (1957) *Trans. roy. Soc. trop. Med. Hyg.*, 51, 11

<sup>b</sup> Cwilich, R., Mer, G. & Meron, A. V. (1957) *Nature (Lond.)*, 179, 636

<sup>c</sup> Busvine, J. R. (1958) *Trans. roy. Soc. trop. Med. Hyg.*, 52 (In press)

<sup>d</sup> Busvine, J. R. & Nash, R. (1953) *Bull. ent. Res.*, 44, 371

days' continuous exposure to the insecticide. The bugs were taken directly from infested beds and were not offered blood meals before or during the tests. Bugs from the dieldrin-treated Pare area and from an untreated area, Kwasunga, about 30 miles (50 km) from the Pare area, were exposed to different concentrations of dieldrin and DDT between August and November 1957. The results, based on four tests at each concentration, appear in the table below; they show that dieldrin had no obvious effect on the bugs from Pare, but that concentrations of 0.1% and over killed all the bugs from the untreated area. Bugs from both areas appeared equally susceptible to DDT at the higher concentrations, but there was greater survival among the Pare bugs at the lower concentrations.

PERCENTAGE MORTALITY IN BED-BUGS CONTINUOUSLY EXPOSED FOR SEVEN DAYS TO DIFFERENT CONCENTRATIONS OF INSECTICIDE IN RISELLA OIL

Dieldrin			DDT		
Concentration (%)	Pare (treated)	Kwasunga (untreated)	Concentration (%)	Pare (treated)	Kwasunga (untreated)
Control	13	18	Control	15	15
0.05	8	95	0.25	25	57
0.07	3	95	0.5	67	95
0.1	8	100	0.7	95	95
0.25	10	100	1.0	87	90
0.5	18	100	2.0	100	97
1.0	18	100			
2.0	8	—			
3.0	25	—			

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