

LABORATORY TESTS OF SELECTED HOUSE FLY REPELLENTS

H. G. WILSON, G. C. LABRECQUE, AND J. B. GAHAN
Entomology Research Division, Agric. Res. Serv., U.S.D.A.

The rapid development of resistance to insecticides in house flies (*Musca domestica* L.) indicates an urgent need for other approaches or alternate means for their control. The use of repellents appears to be practicable in restricted areas and under favorable conditions to relieve the annoyance caused by these insects and to reduce the contamination which is associated with their presence. LaBrecque and Wilson (1959)¹ reported the results of laboratory tests with 65 compounds as vapor or contact repellents to house flies. This paper presents the results with 26 additional chemicals tested by the same methods. Some of the compounds were received from commercial laboratories where they had been developed as fly repellents and others were selected because they showed repellency in other types of tests conducted at our laboratory.

Briefly, the test method was based on the numbers of female flies caught in 30 minutes in traps made of drinking glasses baited with Edamin (a casein hydrolysate) and capped with white cardboard funnels. The number caught in a trap with an untreated funnel divided by the number in a trap with a treated funnel gave the repellency ratio. The repellents were applied at 200 milligrams per square foot, and treated funnels were tested after various periods of aging up to 12 weeks, or until the repellency ratio fell below two.

The results with 12 compounds that gave ratios above two after aging for two days or longer are given in table 1. Four compounds were effective throughout the entire 12-week testing period, namely *n*-octylsulfinylbutyronitrile, decyl lactate acetate, *n*-octylmercaptobutyronitrile, and diisohexylamine. Deet, which has been outstanding as a repellent for personal protection against mosquitoes and biting flies, was effective for two weeks.

The following compounds gave ratios of less than two during the first two days of aging:

ENT. No.	Repellent
20302-b	<i>N,N</i> -Diethylseneciamide
18421	Tricarbethoxymethane
21557	6-Chloropiperonyl chrysanthemumate
26233	4,4-Dimethyl- <i>m</i> -dioxane
26284	4,4-Dimethyl-5- <i>m</i> -dioxanemethanol
26287	2-Ethylhexylamine
26299	Hydrazide of <i>m</i> -toluic acid
30146	<i>N,N</i> -Dibutyl- <i>p</i> -toluamide
30436	Cyclohexyl formate
30486	Tetrahydro-2-furfuryl formate
30490	2,2-Dimethyl-1,3-propanediol diformate

¹ LaBrecque, G. C., and H. G. Wilson. 1959. Laboratory tests with sixty-five compounds as repellents against house flies. Fla. Ent. 42(4): 175-177.

- 30491 1-Allyloxy-3-chloro-2-propyl formate
 30492 2,2,4-Trimethyl-1,3-pentanediol diformate
 30494 1-Allyloxy-3-chloro-2-propyl acetate

TABLE 1.—EFFECTIVENESS OF 12 COMPOUNDS AS HOUSE FLY REPELLENTS IN GLASS TRAP TESTS. (AVERAGE OF TWO REPLICATIONS.)

Code No. ENT-	Repellent	Ratio of repellency at indicated days of aging						
		Days		Weeks				
		1	2	1	2	4	8	12
26029	<i>n</i> -Octylsulfinyl-butyroneitrile	9.8	7.7	3.1	6.4	26.0	4.5	5.3
15705	Decyl lactate acetate	6.4	4.4	2.1	3.8	2.6	2.1	2.2
26028	<i>n</i> -Octylmercapto-butyroneitrile	1.9	15.3	8.0	13.0	16.5	2.8	2.0
16568	Diisohexylamine	54.0	22.5	4.4	2.8	2.4	2.0	2.1
26033	3-Chloro-2-hydroxy-propyl <i>n</i> -octyl sulfide	15.0	12.3	10.3	4.2	15.5	2.7	<1
26030	3- <i>n</i> -Octylmercapto-tetrahydrothiophene-1,1-dioxide	4.0	2.8	3.0	3.7	8.1	1.8	—
16562	Nonylamine	14.0	18.3	2.7	3.2	2.0	<1	—
16575	Trihexylamine	28.0	6.7	9.5	3.3	1.9	—	—
30126-a	<i>N,N</i> -Dibutyl- <i>m</i> -toluamide	15.3	4.3	8.6	4.9	1.7	—	—
22542	Deet (<i>N,N</i> -diethyl- <i>m</i> -toluamide)	20.3	17.3	4.3	3.9	1.0	—	—
25469-X	Pyrethrins (Kenya Oleo Resin, 25%)	2.8	2.8	1.2	—	—	—	—
26282	4,5-Dimethyl- <i>m</i> -dioxane	1.3	2.5	<1	—	—	—	—