Bacteriostatic Properties of Some Derivatives of DDT.*† (22000)

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During an investigation of the fate of DDT in resistant insects, a number of related compounds were synthesized. Since a survey of the literature disclosed little information concerning the effects of these compounds on the metabolism of microorganisms, they were also screened for possible bacteriostatic properties.

The compounds are in general quite water insoluble and it was very difficult to obtain reproducible results using the usual turbidimetric methods to estimate microbiological growth. Such methods are also laborious, time consuming and require large amounts of compound when testing over a wide range. For these reasons the gradient plate technique of Szybalski (16-18) was utilized for quick approximate screening.

Materials and methods. To a slanted petri plate 9 cm in diameter was added 20 ml of sterile nutrient agar (Difco) so that the bottom was just covered. After solidification the plate was leveled and an additional 20 ml of agar containing the appropriate concentration of compound to be tested was added. A waiting period of from 2 to 5 hours at 25°C proved to be sufficient to allow the compound to diffuse vertically and establish a uniform concentration slope by virtue of the thickness

TABLE I. Concentration of DDT Derivatives Required to Inhibit Growth of Microorganisms.

Compound	Source	Microorganism* 1	2	3	4	5
Benzophenone	†					
4,4'-Dichlorobenzophenone	13					
4,4'-Dimethoxybenzophenone	†					
4,4'-Dichloro-3,3'-dinitrobenzophenone	1					
4,4'-Dichloro-3,3'-diaminobenzophenone	12					
4-Chlorophenyl 2-thienyl ketone	4					
Phenyl 2-thienyl ketone	3				54‡	
4,4'-Dimethylaminobenzophenone	†					
4-Fluoro-3-methylbenzophenone	10					
Benzhydrol	2	14	112			
4,4'-Dichlorobenzhydrol	11		112	140	42	
4,4'-Dimethoxybenzhydrol	14					
4,4'-Dichloro-3,3'-dinitrobenzhydrol	10	14	70		14	14
4,4'-Dichloro-3,3'-diaminobenzhydrol	10					
4-Chlorophenyl-2-thienylmethanol	10	70	112	70	42	42
Phenyl-2-thienylmethanol	9		132			
4,4'-Dimethylaminobenzhydrol	8				42	14
α-Methylbenzhydrol	2					
1,1-bis(p-Chlorophenyl) ethanol	5		42	42	42	
1,1-bis(p-Methoxyphenyl) ethanol	6					
1-Phenyl-1(2-thienyl) ethanol	10	224	70			/
1-(4-Fluoro-3-methylphenyl)-1-phenylethanol	10		42	14	14	
1,1-bis(4-Chloro-3,5-dinitrophenyl) ethane	7		112	14	14	112
bis(p-Chlorophenyl) acetic acid	15				14	14
4-Fluoro-3-methylbenzhydrol	10	14	14		14	14

* (1) *E. coli* (sucrose negative); (2) *M. pyogenes* HSR9674; (3) *S. faecalis* ATTC1170; (4) *S. ellipsoideus*; (5) *A. suboxydans* ATTC621.

† Eastman Kodak Co.

‡ Values are given in μg/ml required to inhibit growth. Where no value is given it is taken to mean that growth of the microorganism was not affected by the highest concentration used.

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ratio of the agar layers. The plates were then inoculated with a thin streak of organisms using a small sterile brush. The plates were inverted and incubated for 18 hours. At this time the growth of the organisms could easily be seen and the point where growth was just inhibited determined. Concentrations up to 250 μg per ml were run at least in duplicate. The microorganisms were obtained from stock cultures belonging to the Department of Bacteriology, Oregon State College. The values obtained by this method compared within 15% of those found by standard dilution techniques when using phenol or penicillin G, sodium salt.

Results. In Table I is summarized the results obtained by screening the miscellaneous compounds for their abilities to inhibit growth of the five selected microorganisms. In general the ketones were inactive at a concentration of 250 μg per ml which was the highest level used. Many of the alcohols, however, were quite active in inhibiting growth, some at rather low concentrations. In addition to the organisms listed, most of the compounds prepared were screened against *Candida albicans*. In general no inhibitory effects were noted against this pathogenic yeast; however, 4, 4'-dichlorobenzhydrol completely inhibited growth at 140 micrograms per ml.

Summary. A number of miscellaneous compounds related to DDT have been screened for their abilities to inhibit the growth of 5 select bacteria and yeasts. The alcohols were much more active than the corresponding ketones.

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Failure of Y^{90} to Escape from Skeletally-Fixed Sr^{90}.* (22001)

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In the evaluation of the toxicity of radioactive elements deposited in living animals it is essential to know how much energy is delivered to the irradiated tissues. When the radioactive element gives rise to daughter products of different atomic species possessing physical and chemical properties different from the parent species, particular caution is necessary. This fact was recognized early in the work on radium toxicity when it was discovered that a large fraction of Rn^{222} escaped from skeletally deposited Ra^{226} and was exhaled in the breath. It has also been found recently(1) that considerable ThX (Ra^{224})

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