

Table 1. ACTION OF CPBS, CPCBS AND 'TEDION' ON *Tetranychus urticae* KOCH

Com- pound	Concen- tration (p.p.m.)	Percentage kill			
		Eggs dipped		Eggs layed on residue	
		Direct kill of eggs	Total kill eggs/ larvæ	Direct kill of eggs	Total kill eggs/ larvæ
CPBS	100	24	100	74	100
	30	0	100	14	77
	10	0	69	0	0
CPCBS	100	25	100	58	99
	30	7	100	4	38
	10	0	33	8	10
'Tedion'	100	100		100	
	30	100		100	
	10	100		100	

Table 2. ACTION OF *p*-CHLOROPHENYL, *p*-CHLOROBENZYL-SULPHIDE (CHLOROPARACIDE) AND 'TEDION' ON *Tetranychus urticae* KOCH

Com- pound	Concen- tration (p.p.m.)	Percentage kill			
		Eggs dipped		Eggs layed on residue	
		Direct kill of eggs	Total kill eggs/ larvæ	Direct kill of eggs	Total kill eggs/ larvæ
Chlor- paracide	100	81	100	100	
	30	64	99	100	
	10	45	72	87	97
	3	10	63	10	42
	100	100		100	
'Tedion'	30	85	100	100	
	10	79	97	100	
	3	37	99	94	98

but no deleterious effect could be noted even after ten days.

'Tedion V 18' did not show any visible effect on flies, beetles, aphids and other insects when these were exposed to a dry residual film. Bees were not poisoned by contact or by ingestion of contaminated food. The oral median lethal dose for mice of 'Tedion V 18' exceeds considerably 5 gm./kgm., for this dosage did not cause death or any visible symptom of intoxication among the test animals. Therefore it appears to be a highly specific compound which is safe for the operator and the consumer of the treated products.

Other mites are also killed by 'Tedion V 18'. Field trials on fruit tree red spider (*Metatetranychus ulmi* Koch) have shown that one post-flowering treatment may keep the orchards practically free of red spider up to the autumn. Successful results have been obtained on apples, pears, plums, cucumbers, grapes, carnations, roses and other horticultural crops in the Netherlands, Belgium, Luxemburg and France.

Details of laboratory and field-trials will be published elsewhere.

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<sup>1</sup> Luger, P., Martin, H., and Muller, P., *Helv. Chim. Acta*, **27**, 892 (1944).

<sup>2</sup> Swingle, M. C., Philips, A. M., and Gahan, J. B., "Organic Insecticides for Phytophagous Species". U.S. Dept. Agr. Bull. E-621, Washington (1944).

<sup>3</sup> Browning, H. C., et al., "Toxicity of DDT Analogues: Six Species of Insects", *Prog. Rep.* 15, C.E., 179 DDT (McGill University, 1946).

<sup>4</sup> Eaton, J. K., and Davies, R. G., *Nature*, **161**, 644 (1948).

<sup>5</sup> Eaton, J. K., *Proc. Ind. Int. Congr. Crop Prot.*, London, 1949, p. 119 (1951).

## Control of Yeast Contamination by 'Mycostatin' in Cultures of the Virus of Foot-and-Mouth Disease

CULTURE of the virus of foot-and-mouth disease by Frenkel's method<sup>1</sup>, in which the epithelial tissue of the cattle tongue is used, is being widely adopted for the provision of virus for vaccine production. The tongue epithelium is grossly contaminated with bacteria and yeasts, and antibiotics must be included in the culture medium for their suppression. The bacterial contamination that we have encountered has been effectively controlled by penicillin and streptomycin; but the problem of inhibiting the growth of yeasts remained. During December 1954-March 1955, fourteen apparently distinct strains of yeasts have been isolated from virus cultures in which the tongue tissue was from cattle slaughtered in London. An attempt is being made to identify these strains using the classification of Lodder and Kreger-van Rij<sup>2</sup>. This has led, so far, to recognition of species from the genera *Endomycopsis*, *Saccharomyces*, *Sporobolomyces*, *Candida*, *Kloeckera*, *Trichosporon* and *Rhodotorula*.

It has now been found possible to control this yeast contamination by the addition to the culture medium of 'Mycostatin'<sup>3</sup>, an antifungal substance from a soil actinomycete originally extracted by Hazen and Brown<sup>4</sup>. In *in vitro* tests, 'Mycostatin' inhibited the growth of thirteen of the above fourteen strains in a concentration of 20 units/ml., and the remaining strain was inhibited by 80 units/ml. The addition of 20 units/ml. to the virus cultures has resulted in complete control of yeast contamination. Using fourfold increases in concentration, no decrease in virus multiplication was observed until 320 units/ml. had been exceeded.

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JACQUELINE O. WIGMORE  
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<sup>1</sup> Frenkel, H. S., *Bull. Off. int. Epiz.*, **39**, 91 (1953).

<sup>2</sup> Lodder, J., and Kreger-van Rij, N. J. W., "The Yeasts" (North Holland Publishing Co., Amsterdam, 1952).

<sup>3</sup> Squibb and Sons, E. R., London and New York, trade name for 'fungicidin' or 'nystatin' of Hazen and Brown (ref. 4).

<sup>4</sup> Hazen, Elizabeth L., and Brown, Rachel, *Science*, **112**, 423 (1950).

## Reproduction in the Cat-fish, *Clarias mossambicus* Peters.

No precise information has been published on the breeding habits of *Clarias mossambicus*. Although previous authors who have studied this species in the field give records of ripe females<sup>1</sup> and breeding fish<sup>2</sup>, definite spawning sites have apparently never been determined, nor have the eggs, embryos and larvæ been described.

During recent rains in Uganda an actual spawning site was investigated. Spawning took place in the flooded, low-lying areas adjacent to a shallow drainage stream flowing into Lake Victoria, near Jinja. This stream is separated from the lake by a narrow papyrus swamp which is succeeded on the landward side by a thin belt of the grass *Echinochloa*. When not in spate, the stream is reduced to a series of shallow, disconnected pools without direct surface-water connexion with the lake. Under flood con-