

**ETHER ACETIC AS A FUMIGANT**

DURING the last twenty years much attention has been paid to the use of the fumigants for the control of insect-pests of the stored products. Some of these fumigants have proved to be very promising. But in India little work has been done to study the use of fumigants. After a series of trials it was found that among the fumigants tried, "ether acetic" was a promising fumigant. The results of my small-scale experiments are presented here so that the interested workers may try it on large scale and confirm my view of its use on a commercial basis.

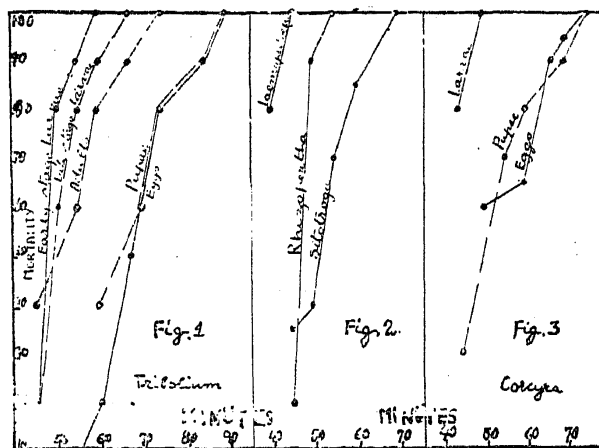
'Ether acetic' has not been used so far as a fumigant. It contains less than 80 per cent. pure ethyl acetate, and about 18 per cent. ethyl ether. Neifert *et al.*,<sup>1</sup> and Back and Cotton<sup>2</sup> have experimented with ethyl acetate, either as such, or in a mixture form with carbon tetrachloride but the ether acetic of commerce has not been experimented upon. Ether acetic is a colourless, clear, watery fluid, with a characteristic pungent smell. It is acid to litmus, miscible in all proportion with alcohol, chloroform, oil and ether. It is soluble in water, being more soluble at lower temperatures than at high temperatures. It is non-poisonous to human beings, and does not stain metal, wood or textile fabrics.

The experiments with ether acetic have been carried out on a laboratory scale. The experimental insects were taken in a small petri-dish and covered with cotton-wool. The dish was buried in a tank (glass) of dried fruits. Near the top of the tank was hung, from its lid, a flat dish containing ether acetic. No special precautions were taken to make the lid air-tight. For every observation a separate set was taken. In those cases in which the mortality was below 100 per cent. the experiments were not repeated. When the mortalities reached 100 per cent., the experiments were repeated at least six times, with different varieties of fruits. A record of temperature and humidity of the atmosphere was retained throughout the period of experiments. The following insects were used in the experiments: *Tribolium castaneum* Hbst (eggs, early larvæ, late larvæ, pupæ and adults), *Rhizopertha domenicæ* Fab. (adults) *Læmophlæus* (adults), *Sitotroga cerealella* Oliv. (early larvæ), and *Corcyra cephalonica* Staint. (eggs, larvæ and pupæ). Adequate controls were run side by side. The dose of the fumigant remained constant, while the period of exposure was varied. The dried fruits used for the experiments were raisins, dates, figs, walnuts and cashew-nuts.

*Tribolium*.—All the eggs were killed within 90 minutes' exposure. The early stage larvæ were killed in much shorter period, viz., 100 per cent. mortalities in 60 minutes. The late stage larvæ appear to be more resistant than the early stage larvæ but less resistant than the eggs (100 per cent. mortality in 67 minutes). The pupæ are more or less as resistant as the eggs (100 per cent. mortality in 90 minutes). The adults are less resistant in comparison either to the eggs or to the pupæ, but more resistant than the larvæ (100 per cent. mortality in 75 minutes).

*Rhizopertha* adults succumb to the action of the fumigant within 55 minutes. The fumigant is equally effective against *Læmophlæus* adults (100 per cent. mortality in 45 minutes), *Sitotroga larvæ* (100 per cent. mortality in 70 minutes), and *Corcyra* (the time taken for 100 per cent. mortality in the case of eggs 75 minutes, larvæ 50 minutes and pupæ 75 minutes).

The mortalities which take place after an exposure for shorter periods than mentioned above are shown in the graph.



Ether acetic is an effective fumigant for controlling insect-pests of dried fruits. A dose of ½ oz. per 6 cubic feet of space is sufficient to achieve 100 per cent. mortality in case of *Tribolium castaneum*, *Rhizopertha domenicæ*, *Læmophlæus*, *Sitotroga cerealella* and *Corcyra cephalonica*.

The work was carried out in the laboratory of the Imperial Entomologist, New Delhi.

Agricultural Research  
Laboratories, Gwalior, R. RAKSHPAL,  
October 15, 1945.

1. Neifert, Cook and others, *U.S., Bull.*, 1925, 1313.
2. Back and Cotton, *J. Econ. Ent.*, 1924, 17, 663.

**STUDIES IN THE SYNTHESIS OF SOME SUBSTITUTED BENZENESULPHONAMIDES PART. IV—SYNTHESIS OF TWO NEW N<sup>1</sup>-SUBSTITUTED p-ACETAMINO-BENZENESULPHONAMIDES AND THE CORRESPONDING FREE p-AMINO COMPOUNDS**

In connection with the preparation of the azo compounds of Part III,<sup>1</sup> a review of the final reduction products, namely, the corresponding aminobenzenesulphonamides, revealed that p-aminobenzenesulphon-, methyl and ethyl-anilides and the corresponding N<sup>1</sup>-acetyl derivatives have not been synthesised so far. Their synthesis was, therefore, undertaken.

The method employed consisted of the condensation of p-acetaminobenzenesulphochloride (1 mole.) with methyl- and ethyl-anilines (each 2 moles) respectively, in alcoholic solution. The acetamino compounds were isolated and subsequently hydrolysed by boiling with 10 per cent. aqueous hydrochloric acid to the free amino compounds in the usual manner.

The equivalents of the two amino compounds were determined by diazotisation in acid solution with a standard solution of sodium nitrite checked against a standard solution of pure sulphanilic acid.