SOME EXPERIMENTS ON THE VACUUM DISTILLATION OF POTATO ROOT DIFFUSATE 1)

BY

D. W. FENWICK
Rothamsted Experimental Station, Harpenden

In a previous paper (FENWICK & WIDDOWSON, in press), methods were described for collecting and storing potato root diffusate. Storage at 3-4° C is satisfactory for up to two years but lack of space frequently limits the volume which can be stored at any given time. Attempts were therefore made to reduce this volume by vacuum distillation. Previous experiments in this connection have been described by HAGUE (1954) who found that vacuum distillation at 5° C at 1 mm. of mercury could be carried out with a reduction to 1-4 % of the original volume and a loss of only 5-10 % of the active principle. Subsequent freeze drying resulted in higher concentration with a further loss of about 30 %. HAGUE did not describe his apparatus but the low temperatures and pressures involved suggest rather elaborate equipment. It would be convenient to carry out the distillation at a higher temperature with simple equipment and the present paper is concerned with an investigation into this possibility.

Stability of Potato Root Diffusate to Temperature

Experiments were carried out on the stability of potato root diffusate at different temperatures. Samples were maintained at 30, 40, 50 and 60° C for 2, 4, 8, 16, 32 and 64 hours after which they were assayed by the methods of FENWICK & WIDDOWSON (in press). Replication was five-fold; untreated samples gave L.A. values of approximately 2.8 and larval emergence in these averaged approximately 140 larvae per cyst over three weeks corresponding to over 80 % of total contents. The results of these assays are set out in Fig. 1. Fall in activity at 30 and 40° C after 8 hours was very slight; the loss at 50 and 60° C was greater, the L.A. value falling by about 0.5. 16 hours at 30 and 40° C resulted in a fall of about 1.0 L.A. units corresponding to a loss of 90 % of the active principle. Repetition of

1) Received for publication: April 11, 1957.
this experiment with other samples of diffusate gave similar results, a typical set of data being given in Table I. A large number of tests showed that up to 8 hours exposure to 30° or 40° C resulted in only a slight loss of activity; the average decrease in L.A. value for eight hours at 40° C was about 0.15 L.A. units corresponding to a 30%